OCTOBER 1953

The Paper Industry

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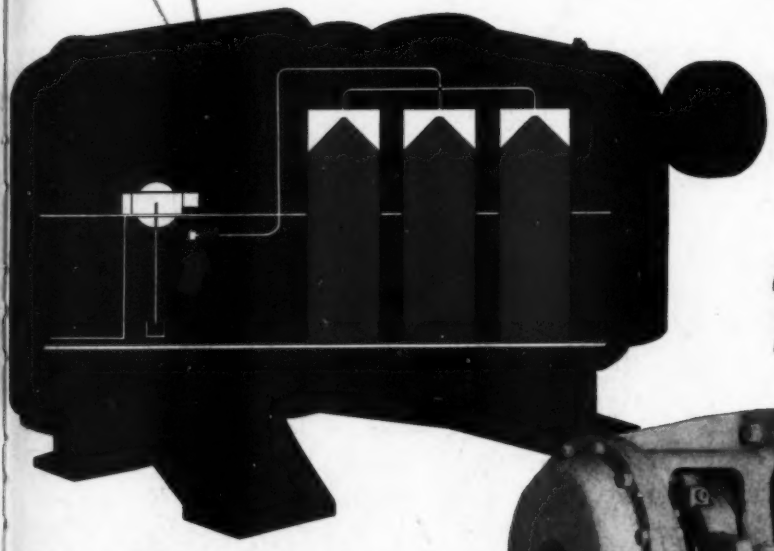
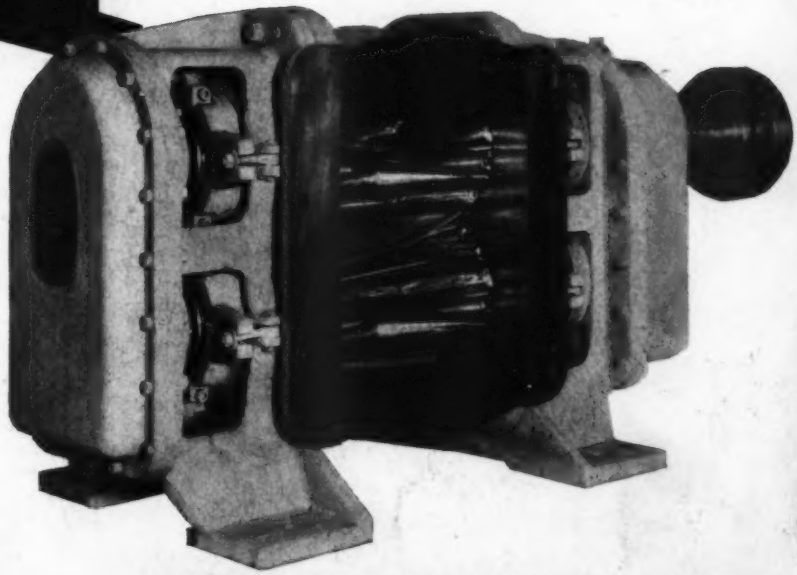
DETROIT

IMPCO THICK STOCK PUMP



PUMPING 10%-17% PULP

SERIES - 300*
SERIES - 500*



s unit is a positive displacement type pump ecifically designed to handle pulps at high den- es. The conical profile of its synchronous rotors rmits the pumping of stock at densities above % A.D.—with lowest horsepower per ton—and fibre damage. Operating on all types of stock as:

- A transport pump on high density stock
- A feeder to high density hypochlorite and ClO_2 bleachers.
- A beater filling pump from storage.

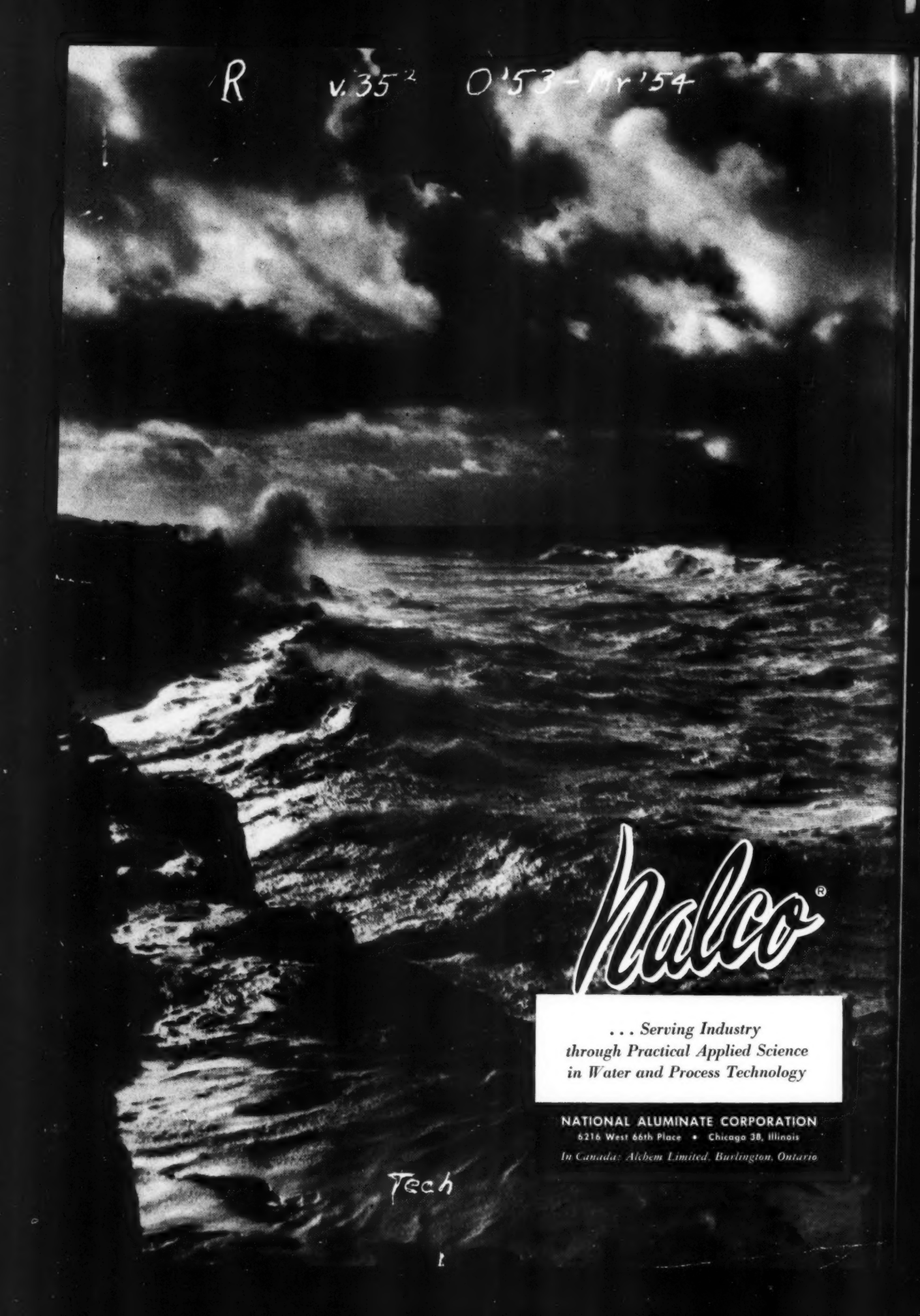
y the modern way to handle pulp.

*—*Tons per day.*

IMPCO

IMPROVED MACHINERY INC.
NASHUA—NEW HAMPSHIRE
Sherbrooke Machineries Limited manufacture similar equipment in Canada.

R v.35 2 0'53-Mr'54



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through Practical Applied Science
in Water and Process Technology

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Tech

Asten DRYER FELTS

Heavy stare

If your machine tender gives you a look like this when you ask him how things are going, you'd better change over to ASTENS.

Economy in the long run

ASTEN-HILL MFG. CO.
PHILADELPHIA, PENNA.

ASTEN-HILL LIMITED
VALLEYFIELD, QUEBEC

NEW ENGLAND—one in a series of scenes where Appleton Wires serve the paper industry.

PRACTICALLY everywhere you find a paper mill, you will find Appleton Wires. Though you ordinarily think of New England as the birthplace of new world traditions, rugged coastlines and industries of the sea—such as lobstering—it also has 277 paper mills, most of which know that *Appleton Wires are Good Wires!*

APPLETON WIRE WORKS, INC., APPLETON, WISCONSIN

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 35 • NUMBER 7 • OCTOBER, 1953

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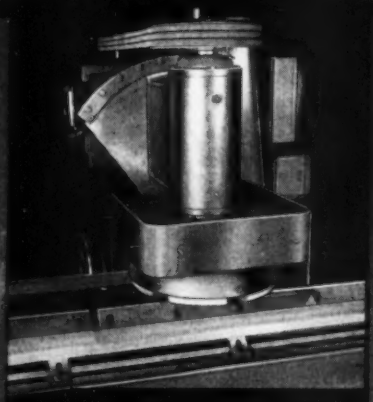
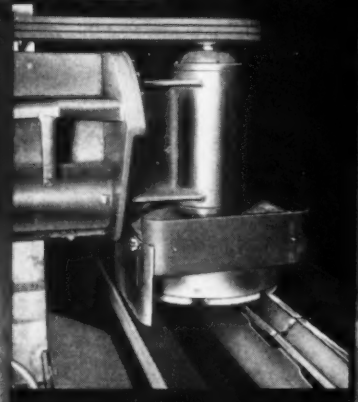
HIGH ALLOY GRADE CHIPPER KNIFE IS TYPICAL EXAMPLE OF BEVEL FINISHING OR RE-GRINDING. SHARPENING IS RAPIDLY ACCOMPLISHED WITHOUT THE HAZARD OF BURNING

the new "CLEVELAND" hydraulic bevel knife grinder



GRINDING HEAD IN TILTED POSITION SHOWING EDGE OF GRINDING WHEEL CONTACTING KNIFE

EDGE OF KNIFE BEING BEVELLED



18" DIA. SEGMENTAL GRINDING WHEEL. NOTE: WHEEL OFF CENTER OF WORK AT BEGINNING OF GRINDING CYCLE

GRINDING WHEEL TRAVELS HYDRAULICALLY ACROSS KNIFE EDGE BEING BEVELLED

● With the Cleveland *100% Hydraulic* Knife Grinder "burning" is *no longer* a hazard when regrinding high carbon high chrome chipper knives. Increased blade life means dollar savings — Unusually fast — Cool and continuous cutting action — Extremely accurate — Low cost operation.

The vertical wheel head of the "CLEVELAND" Hydraulic Knife Grinder is arranged to "tilt" from the vertical position. Therefore, the plane of the 18" diameter segmental grinding wheel is at an angle to the work being bevelled as the outside rim of the grinding segments is brought into contact with the knife being ground. Hydraulic cross feed is provided for the vertical wheel head at instantly variable speeds as the grinding wheel travels across the work horizontally. This hydraulic cross feed permits the grinding wheel to feed into and across the work without actually moving the head down, and as soon as the work being ground comes in line with the center of the vertical spindle, the hydraulic cross feed stops, — then through the use of the hydraulic rapid traverse the wheel head is returned to the original position and manually fed down to a predetermined feed by the operator and the cycle again repeated, etc.

new

revolutionary and proven

grinding principle

for regrinding chipper • barker • hog knives • trimmer knives • doctor blades

It is not necessary for the operator to employ constant down feed for bevel grinding, since after the vertical wheel head is initially fed into the work unusually sharp, fast, cool and continuous cutting action takes place BECAUSE, 1. The grinding wheel is OFF center as the vertical wheel head is fed into the work by the operator. 2. The grinding wheel continues to feed (horizontally and automatically) across the work. 3. "CLEVELAND" Hydraulic Knife Grinders are equipped with the famous "HILL" hydraulic table drive which reciprocates at extremely low pressure through two opposing pistons, resulting in smooth, positive and economical operation; table speeds are instantly variable up to 100 feet per minute. 4. The unusually fast and positive cutting action produced by the "CLEVELAND" Hydraulic Knife Grinder is favorably reflected by the reduced horse power demand for the main drive or spindle motor: — Actual experience over several years has proven that 20 HP is normally sufficient for the "V"-belt operated wheel head, and further, the relatively low HP demand for the grinding wheel eliminates the necessity of a built-in spindle motor.

"CLEVELAND" Hydraulic Knife Grinders are available in a wide range of table lengths from 60" to 240".

THE HILL ACME COMPANY

1201 WEST 65th STREET • • • CLEVELAND 2, OHIO

ANNOUNCING

OUR BUILDING AND INSTALLING

The Improved

ROBERTS GRINDER

We are now building the Roberts Grinder, incorporating many new features of improvement that means greater operating efficiency, rugged and quality construction, greater production, less H. P. per ton of pulp and higher brightness. New control features means obtaining practically any type of pulp desired. Roberts Grinders are available in three sizes to take 2-foot, 4-foot, and 5-foot wood.

ROBERTS GRINDERS BUILT PREVIOUSLY — We also wish to announce we have blueprints and patterns available to service your requirements on maintenance and parts of any previous grinders built.

ROBERTS GRINDER *Advantages and Savings* FOR YOUR MILL... Greater production — up to 50 tons a day per grinder • Replaces 3 to 4 pocket grinders • Saves up to 50 percent floor space • Greater grinding area permits more pulp per unit • Less waste • All-enclosed operation eliminates steam and vapor • Fits existing buildings with normal headroom • More uniform, higher quality pulp • Higher brightness • Less H. P. per ton.

Your inquiries are invited for a survey application of the IMPROVED Roberts Grinders to your mill requirements.

100TH ANNIVERSARY 1853 1953

designing and building paper making machinery

BAGLEY & SEWALL

WATERTOWN • NEW YORK

***Foreign Representative* • CASTLE AND OVERTON, INC., 630 Fifth Ave., New York 20, N. Y.**

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make your Stainless Tubing choice extra tough?

Whether one or more of these factors pose a problem in the design of your product or installation, you'll find what you require—exactly—in the wide range of B&W Welded Stainless Tubing and Pipe available. Whatever your particular fabrication, production, and service requirements, B&W's exacting manufacturing methods and checks assure you of Welded Stainless Tubing which has retained all of the inherent qualities and characteristics of the steel itself . . . is, in effect, custom-produced to your needs.

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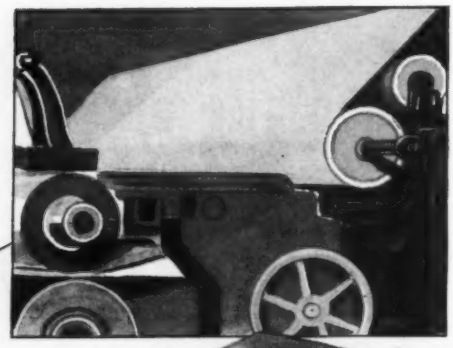
B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

TA-1795(G)

Paper machines running faster than sound ?



fantastic!

Maybe not so fantastic as you think! They are already building jet planes that go faster than sound. Industry is gearing itself to speeds that were considered impossible when most paper and board machines now in service were designed. Gravity can't pull out the water that fast. Old style felts were woven too tight for that.

Shuler & Benninghofen are ready with new style Hamilton Felts. The open spaces between threads are large enough to let the water flow through under the extra pull of suction headboxes. These new style Hamiltons have unusually long and thick nap. The nap filters out any fibers that may pass through with the water. It also gives fine finish without leaving felt marks.

The Hamilton sales engineer who calls on you will explain which of the 300 styles will do your work best, fastest and at lowest cost.

Hamilton Felts

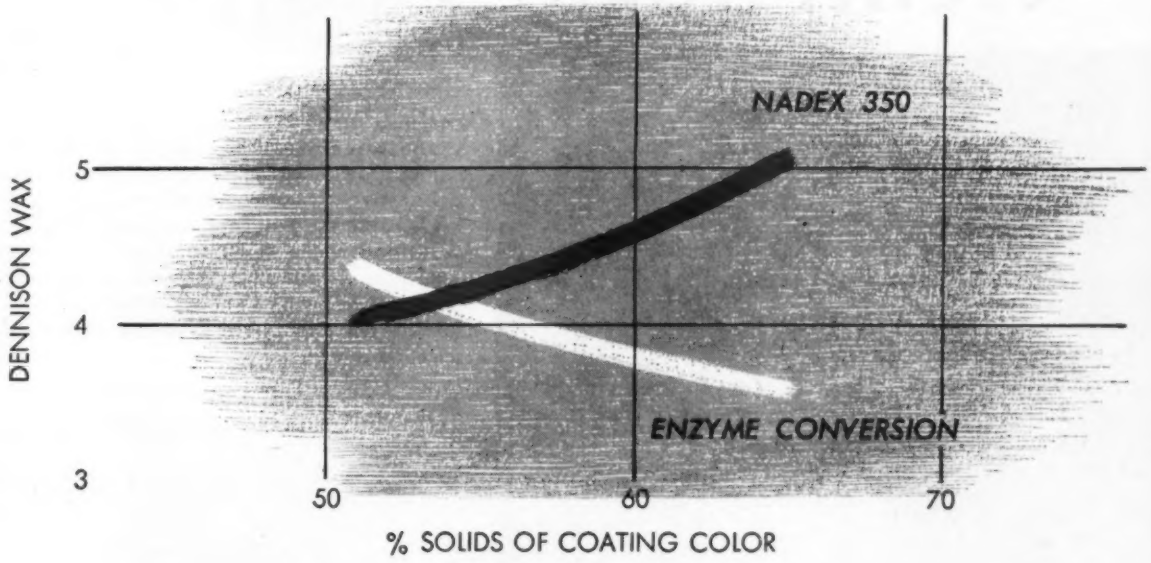
MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

HIGHER PICK

AT 65% SOLIDS



. . . for all coated stocks

NADEX 350 —a special dextrin for coating. Gives a higher pick than enzyme converted starches when used in high solids coatings. No matter what the stock.

NADEX 350 need only be cooked. No need for expensive conversion equipment, enzymes, extra technician time.

NADEX 350 can be cooked at 47% solids. There's more water available for pigment dispersions. Fewer formulating problems.

NADEX 350 offers good strength, adequate stability, high uniformity, and lower viscosity characteristics for machine or off machine coating.

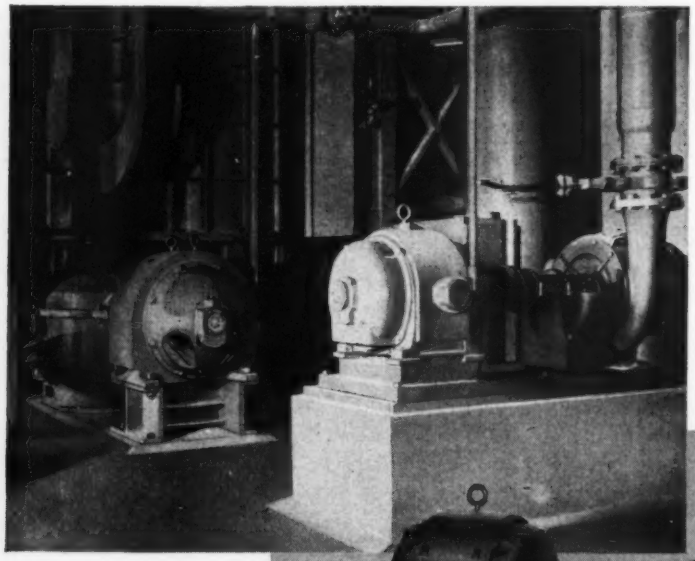
For full information on NADEX 350 or on National's other coating dextrins or starch products write —

National
STARCH PRODUCTS

270 Madison Avenue, New York 16, N. Y.

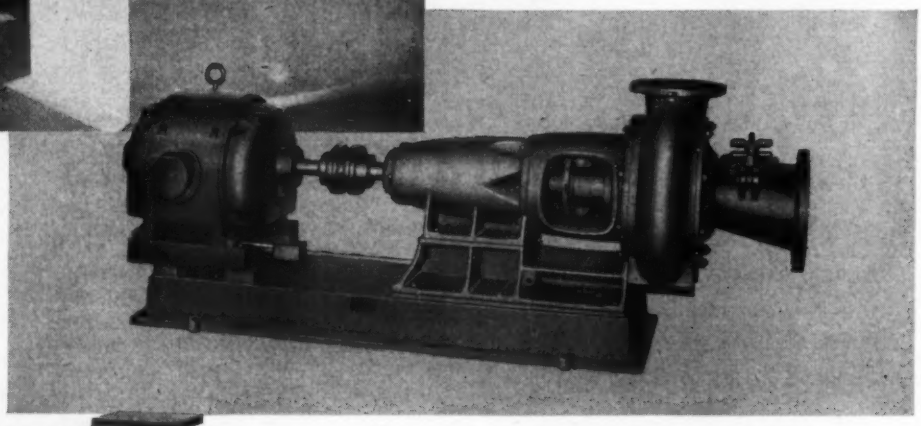
THE KEY TO SUCCESSFUL STOCK HANDLING

Downingtown-Economy Centrifugal Pumps

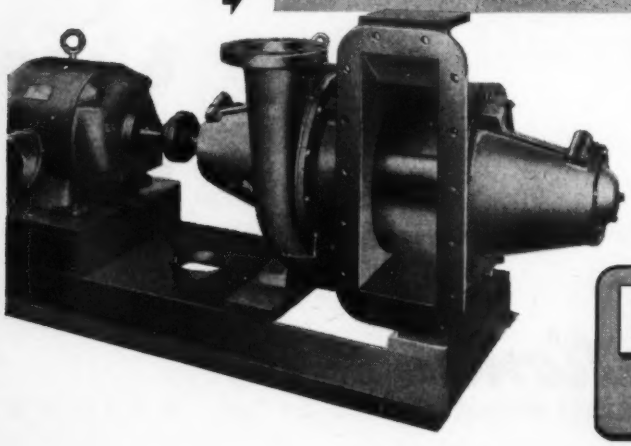


Designed and built expressly for the paper and board industries, Downingtown-Economy Pumps provide the most efficient and economical answers to the problems encountered in stock handling. Standard materials used are those best suited to normal mill operating conditions. Custom engineered pumps are furnished with special metals and for unusual service. All pumps are available in a wide selection of capacities.

Write for the new Downingtown-Economy Pump Bulletin, which gives complete selection tables.



DOWNINGTOWN-ECONOMY
Double Suction White Water Pumps
This group of pumps is designed to handle white water and general water supply.



DOWNINGTOWN-ECONOMY
Single Suction HC* Stock Pumps
For high consistency stocks, these pumps are equipped with specially designed impellers. HC Stock Pumps are available in both vertical and horizontal models.*
*High consistency

DOWNINGTOWN MANUFACTURING CO.
DOWNINGTOWN, PA.

West Coast Representative:
John V. Roslund
Pacific Bldg.
Portland 1, Oregon.

DOWNINGTOWN
DESIGNERS AND BUILDERS OF PAPER, BOARD AND FELT MACHINES SINCE 1880
MODERNIZATION IS PROFITABLE

PROOF!

KELSIZE keeps glue line where you need it!

Maximum bond and 100% fibre pull does not depend on excessive penetration as proven by illustration below showing complete fibre pull of pressure sensitive tape whose penetration factor is nil.

1. Stick strip of tape to piece of corrugated paperboard.

2. Lift tape off. Note how surface fibres of paperboard adhere to tape, proving a completely uniform bond has been obtained.

Make this test yourself. Prove that you don't need excessive glue penetration for maximum bond. In fact, only by keeping the glue line at surface do you get maximum bond — with substantial glue savings!

A fraction of a percent of KELSIZE added to your adhesive will control penetration and keep your glue line where you need it.

KELSIZE insures uniform adhesive application and aids in moisture control of corrugated paperboard

KELSIZE® a product of **KELCO** company

20 N. Wacker Drive
Chicago 6, Illinois

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New York 5, New York

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Los Angeles 14, Calif.

Cable Address: Kelcoalgin — New York

KELCO
REFINED ALGIN PRODUCTS

One of the largest manufacturers of wallboard and insulating board was building a giant new plant in the deep South. They wanted the same smooth pulpwood handling that speeds production at their Virginia plant. So they called in the same engineering-production team — Jeffrey.

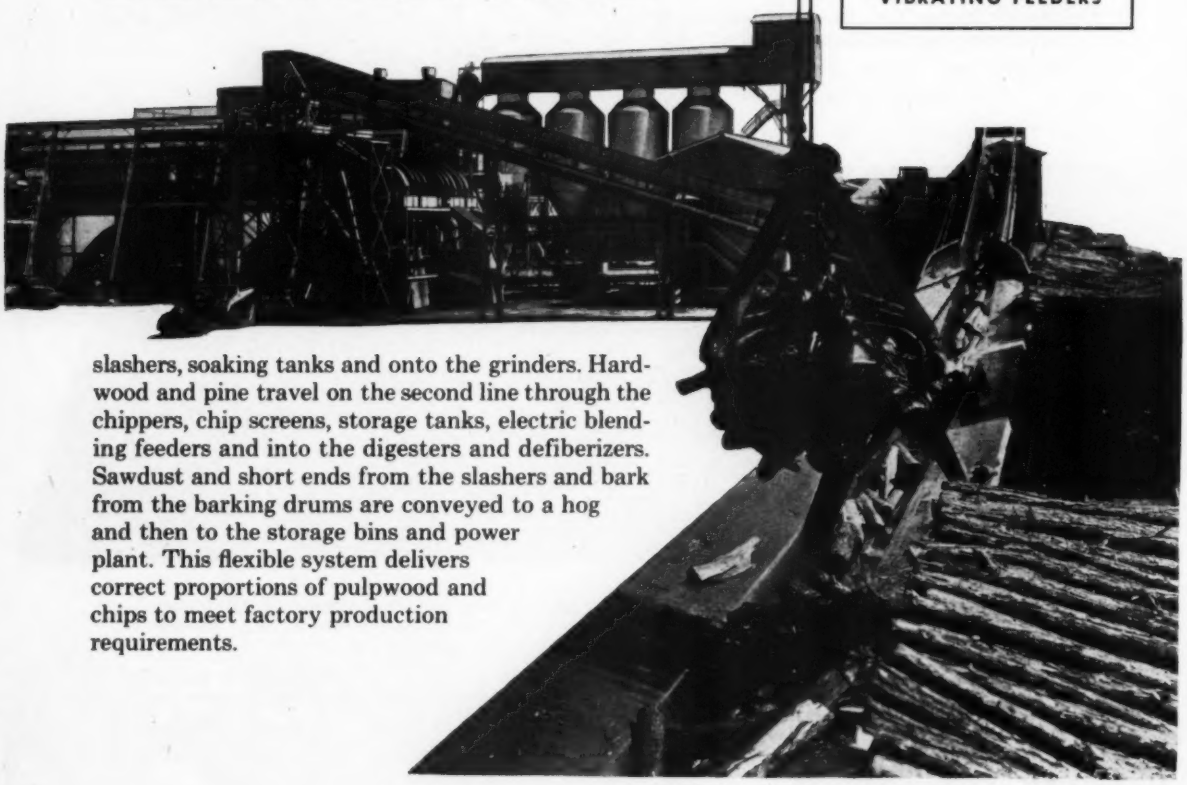
PULP STORY

Jeffrey's conveyor specialists worked with the client's engineers to design two separate lines which handle pine and hardwoods from railroad cars through a dozen processes to the grinders and defiberizers.

An orange-peel grapple drops pine from the cars or storage piles onto the yard conveyors. The first line carries it through the barking drum,

TYPES OF JEFFREY EQUIPMENT USED IN THIS INSTALLATION

BUCKETS • CHAINS
SPIRALS • IDLERS
SPROCKETS
SPLINTER GRINDER
APRON FEEDERS
TRACK HOPPER
VIBRATING FEEDERS



slashers, soaking tanks and onto the grinders. Hardwood and pine travel on the second line through the chippers, chip screens, storage tanks, electric blending feeders and into the digesters and defiberizers. Sawdust and short ends from the slashers and bark from the barking drums are conveyed to a hog and then to the storage bins and power plant. This flexible system delivers correct proportions of pulpwood and chips to meet factory production requirements.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED
. . .IT'S A JOB FOR JEFFREY!

"MODEL STAR" GATE VALVE *(Fig. 1793)* for 125 pounds W.P. Iron body, bronze mounted. Supplied with taper solid wedge. Sizes 2" to 30", inclusive.

AN OPEN AND SHUT CASE

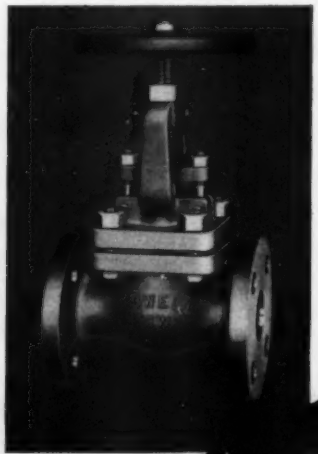
All the evidence is in. Powell Valves have a record of dependability since 1846. Powell makes more types of valves, has probably done more valve research and solved more valve problems than any other organization in the world.

On the basis of such overwhelming evidence, can your verdict be anything but a decision in favor of Powell Valves? See exhibits following.

LUBRICATED PLUG VALVE *(Fig. 2200 SE)* available with Screwed or Bolted Glands. Semi-Steel valves available for 175 and 200 pounds W.O.G. Carbon Steel valves available for 150 and 300 pounds W.P.

O. S. & Y. "Y" VALVE *(Fig. 1944)* for 150 pounds W.P. Stem is threaded, guided, rises through a bronze bushing in upper yoke. Disc can be quickly, easily removed. Sizes 2½"to 12", inclusive.

O. S. & Y. GLOBE VALVE *(Fig. 2475)* for 150 pounds W.P. Bolted flanged bonnet, outside screw stem and yoke. Plug-type disc. Valve sizes are ¼" to 3", inclusive.



P V

the *Respected* "family circle"

...of pulp, paper and textile mill equipment. For 70 years Appleton Machines have been custom-built to standards that have *earned* the respect of the industry.

APPLETON MACHINE COMPANY
APPLETON WISCONSIN

CUSTOM-BUILDERS OF PULP & PAPER MACHINES · WINDERS · FINISHING ROLLS · REWINDERS

FOR BETTER PERFORMANCE

ON YOUR PAPER MILL DRIVES

SPECIFY FAWICK CLUTCHES!

The world-famous FAWICK AIRFLEX TYPE CB CLUTCH

The new completely ventilated FAWICK TYPE VC Air-Ring CLUTCH.

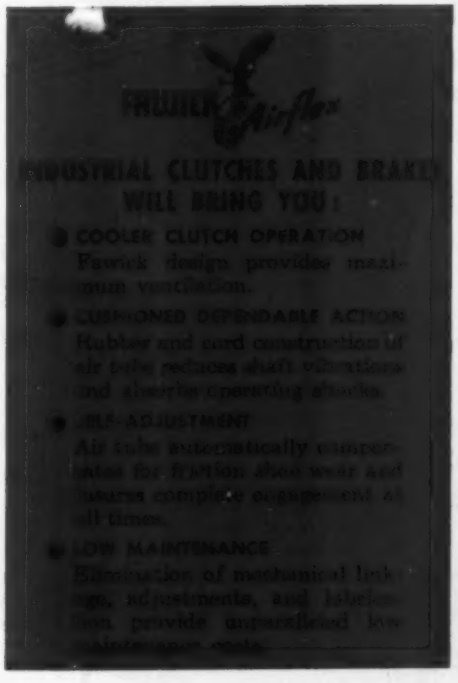
YOUR best way to insure better performance on your paper mill drives is to make certain they are equipped with FAWICK AIRFLEX CLUTCHES.

The superior performance of FAWICK CLUTCHES results in important advantages that provide unmatched operating smoothness, dependable clutch operation, and continuous "new clutch" action.

The dependable operation and superiority of the FAWICK TYPE CB CLUTCH is recognized throughout the industrial world. The new FAWICK TYPE VC Air-Ring CLUTCH, which is particularly adaptable for dryer drives, is unmatched for heavy-duty service where high starting loads or sustained slippage generate high operating heat that lowers operating efficiency and shortens clutch life.

Specific operating characteristics of each of these FAWICK CLUTCHES provide distinct advantages to paper mill drives. Fawick Engineering Service is available for solution of specific sectional drive power transmission problems. Call or write the Main Office, Cleveland, Ohio.

FAWICK AIRFLEX DIVISION
FEDERAL FAWICK CORPORATION
9919 CLINTON ROAD • CLEVELAND 11, OHIO



FAWICK Airflex
INDUSTRIAL CLUTCHES AND BRAKES

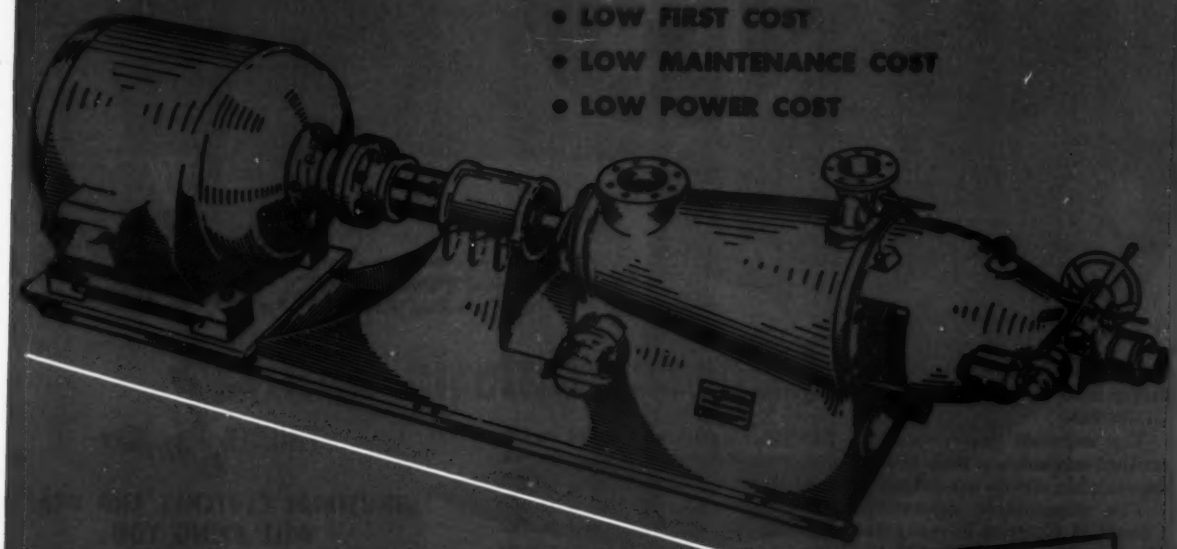
For further information on FAWICK Industrial Clutch and Brake Units write to the Main Office, Cleveland, O., for Bulletin 400-A and ML-102.

Announcing

the great new E.D. Jones

STOCKMASTER

- LOW FIRST COST
- LOW MAINTENANCE COST
- LOW POWER COST



✳ LOOK AT THE RECORD

Here's a comparison of the results achieved on the same stock under the same conditions by the STOCKMASTER and a competitive "beater" type refiner.

COMPARATIVE TESTS UNBLEACHED DOUGLAS FIR KRAFT

	Stockmaster 900 R.P.M.	Competitive "Beater" Type Refiner 870 R.P.M.
Speed		
Pulp Quality After Applying 600 HP Hrs./Ton		1.96
Fibre Length — MM*	250	325
Freeness — CC CS	7000	6300
Breaking Length — MM	45	37
Burst — Metric	182	144
Tear Factor		
		2.05
Pulp Quality-At 400 CC CS Freeness	2.32	550
Fibre Length — MM*	410	5800
Power Required — HP Hrs. Per Ton	6100	36
Breaking Length — MM	42	172
Burst — Metric	218	
Tear Factor		

*Raw Fibre Length — 2.73 MM

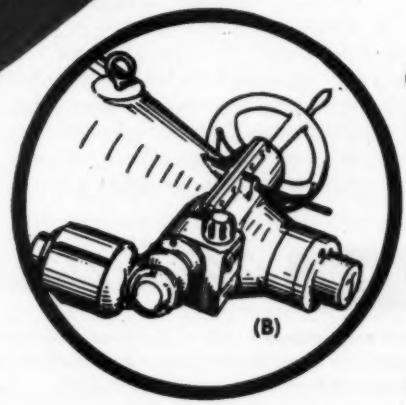
for superior continuous beating

Here's a great new conical refiner — the JONES STOCKMASTER® with range, flexibility, control and *results* to meet your every need.

The wide selection of tackle available, plus precise control of rotor — combined with suitable stock flow, consistency and stock pressure — give the operator a truly flexible and controllable refining machine. The results produced are superior to other types of beating and refining equipment.*

Low in first cost, the STOCKMASTER is simple and economical to operate and maintain. And JONES engineering guarantees many years of trouble-free, dependable and efficient performance.

(A) **Standard adjusting mechanism** — 10" hand wheel with worm and worm gear reduction — permits very accurate adjustment of plug position and absorbed horsepower. It is a simple matter to add necessary gear motor and parts to change over to ACCRU-SET control at a later date.



(B) **ACCRU-SET® Control** — At modest extra cost, the basic mechanism shown above can be fitted with a gear motor for any desired type of control, from a simple push-button arrangement for remote control to full automatic control of applied power with indicating or recording, current-sensitive or watt-sensitive instruments.

And ask your Jones representative about application of ACCRU-SET to your present refiners.

Ask your Jones representative or write direct today for our Bulletin 1047, giving specifications and full details.

E. D. Jones

E. D. JONES & SONS COMPANY
PITTSFIELD, MASSACHUSETTS

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

For strong, dependable closures—use strong, dependable ARMOUR glue!

Armour's CX Bone glue is the perfect "strong" glue for gummed paper tape, kraft sealing tape and gummed labels

Strength and dependability are the reasons for using gummed paper tape or kraft sealing tape. Why take chances on these vital properties by using anything but the finest domestic glues?

When you buy Armour CX Bone Glue, you *know* what you are getting—the finest low-priced glue for gummed tape. It's produced with all the skill and experience of our 68 years of making glue. You know it's uniform and dependable, unvarying in quality, with high viscosity and a pleasant odor. And you know that tape made with CX Bone Glue moistens readily and has a quick grab.

There's no point in taking chances on the quality of the glue used for any paper or converter process, because there's an Armour glue that fits each job. Our BC Hide Glue is an accepted standard for use in Sveen retention systems, and our lower test, low price CX is gaining in popularity for use in the same process. Our clear chrome hide glue is extensively used for surface or tub sizing of rag bond paper. We have glues for "on machine" creping directly from the Yankee Dryer that supply the tacking properties necessary for softness in paper tissues. There's a dependable Armour glue for any paper operation. Write Armour today for complete information, including prices.

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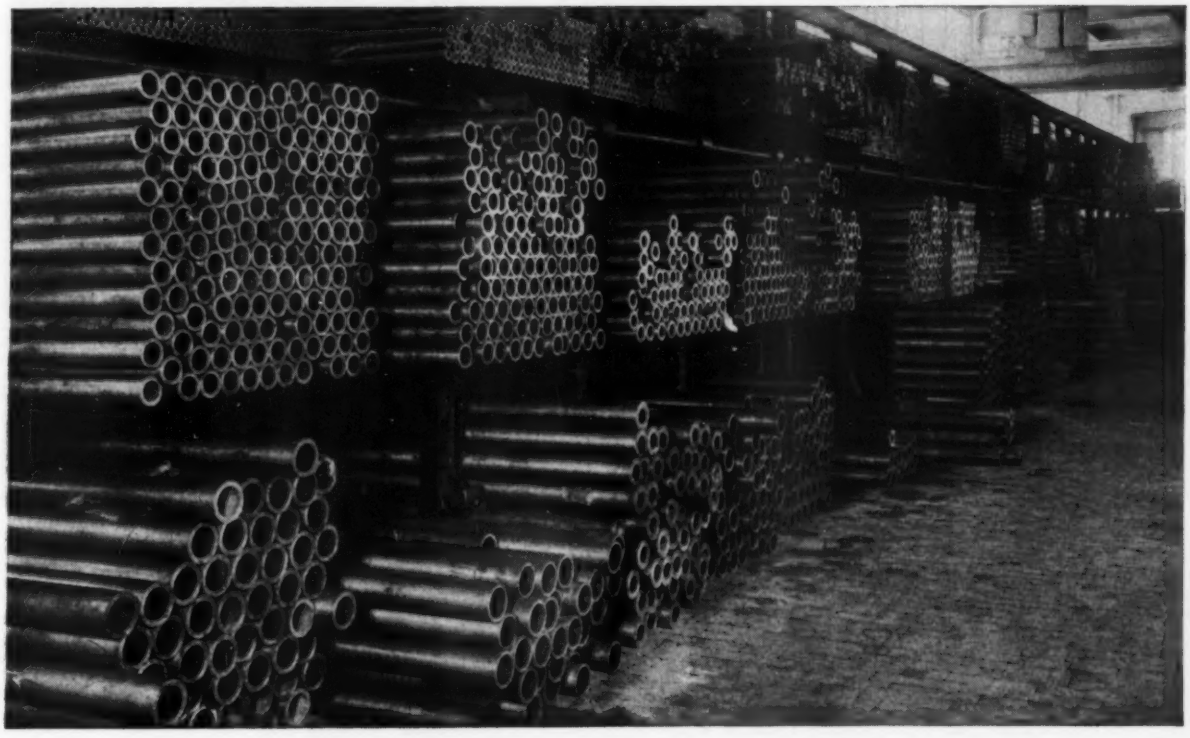
Order wear-resistant 52100 tubing today



. . . we ship it from here tomorrow!

IF you're in a hurry for wear-resistant 52100 tubing, phone, wire or write the Timken Company. Shipment will be made from mill stock within 24 hours after receipt of your order!

52100 steel tubing manufactured by the Timken Company can be heat treated to file hardness and tempered back to any desired point. A high carbon chrome steel, it is through-hardening in moderate sections and can often be used in place of more expensive steels. It's available in a wide range of sizes from 1″ to 10½″ O.D.

Timken® 52100 tubing will do many of your hollow parts jobs: aircraft parts, ball bearings, pump parts and plungers, collets, bushings, spindles, grinding machine parts and precision instrument parts, to name a few.

As America's earliest and foremost producer of 52100 tubing, the Timken Company has unequalled experience that results in uniform high quality from tube to tube and order to order. Rigid quality control checks every step of production.

For immediate delivery of your less-than-mill-quantity orders, write, wire or call The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

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With Link-Belt 45° roller bearing idlers increasing its capacity as much as 60%, this 6-ft. wide belt conveyor easily transports chips to storage silos.

TOTAL ENGINEERING

It's LINK-BELT's answer for improved belt conveyor performance

BELT conveyor efficiency begins with correct analysis of overall system requirements. And right from the start Link-Belt offers you unique advantages. Our engineers can apply broad experience to your bulk handling problems.

Working with a complete line of quality components, they can select the belt conveyor equipment best suited to your exact needs. What's more, Link-Belt has a nation-wide engineering organization that will follow through on every detail. This includes supplying all related equipment . . . building supporting structures and enclosures . . . erecting the complete job, if desired.

It's easy to see why "total engineering" results in top belt conveyor performance. For complete information, call the Link-Belt office near you today.

13,131-A

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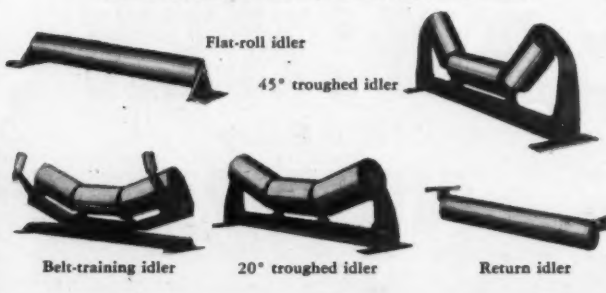
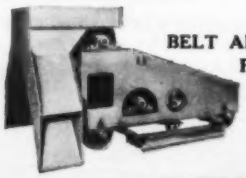
BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities.

LINK-BELT builds a complete line of belt conveyor components

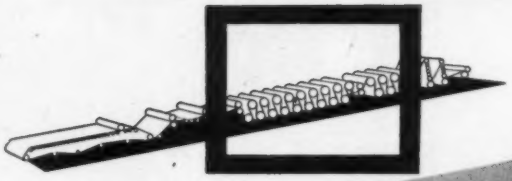
ALL TYPES OF ROLLER BEARING IDLERS





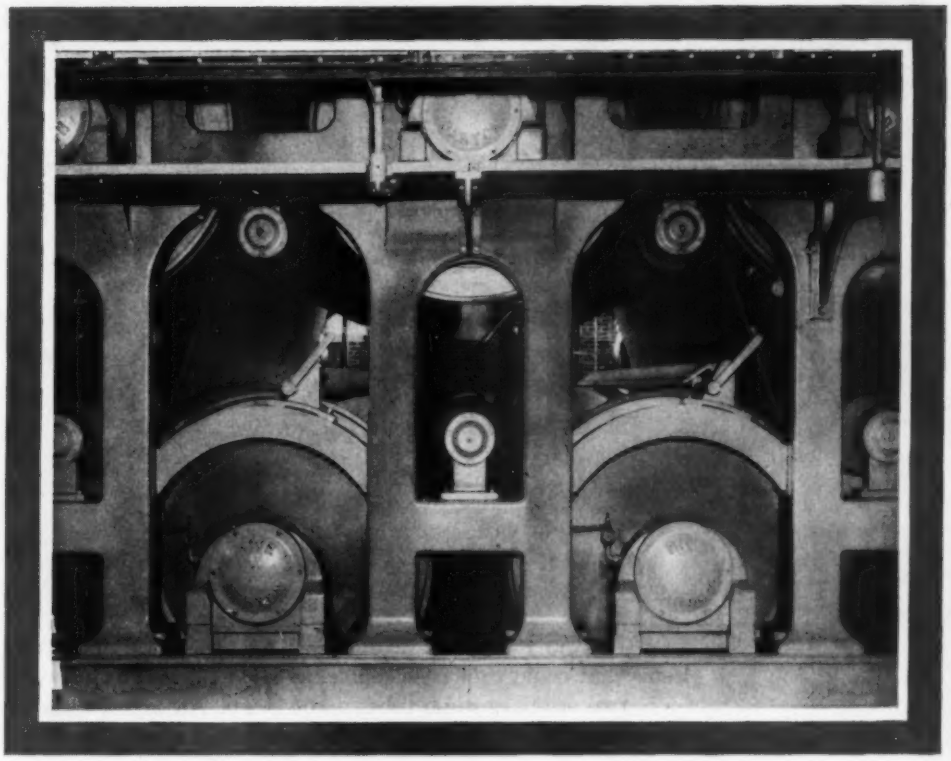
BELT AND MOTOR PROPELLED TRIPPERS

COMPLETE TERMINAL MACHINERY



For Peak Dryer Efficiency . . .

- - a Rice Barton Dryer Section



Rice Barton's unique spacing of dryers, which provides more evaporation space within a given length in the dryer section, increases drying rates without affecting steam consumption.

— and of course . . .

Shop erected and aligned dryer sills, frames and bearings, which eliminate costly drilling in the field, balanced dryers, and hobbed and generated-tooth dryer gears are among the many standard features which make a Rice Barton dryer section superior.

RB 10-53

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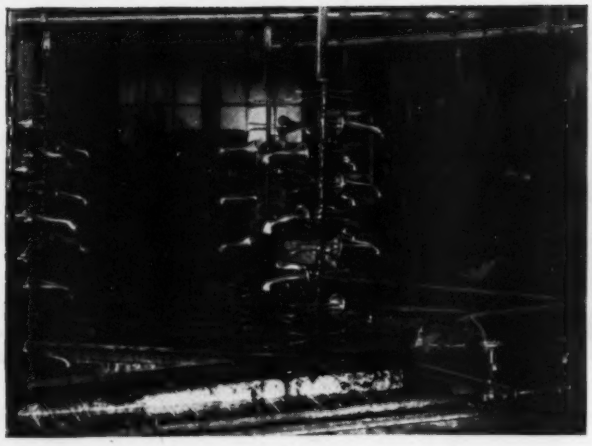

Electromax for plating-tank control at Barnes Manufacturing Co. (plumbing fixtures) saves its cost in 6 months in reduced maintenance. Electromax resists humidity & acid mist.

The Sterling China Co. says "Our two Electromaxes do a perfect job at no expense; no maintenance; no attention from supervisors". Electromax resists dust & vibration.

No-maintenance Controller?

WELL, ALMOST . . .

● For years at a time, your instrument maintenance men may never even see the inside of your Electromax Temperature Controllers.

And when they do look into one, they find only five items that could ever need replacing—two 120-volt light bulbs, two ordinary radio tubes and a relay. All five of these expendable elements could be replaced in five minutes.

Fine engineering, however, greatly reduces the chance of even that much maintenance. Design requires the two radio tubes to operate at only 10% of rating. The relay (the only moving part in the whole instrument) is a hermetically-sealed, plug-in type. There's no dry cell, no standard cell, no ink, no chart, nothing to lubricate.

With its small size, low price, excellent accuracy and really remarkable simplicity, you'll find many uses for Electromax, at temperatures to 1000 F. You can get full information from the L&N office nearest you, or from 4974 Stenton Ave., Philadelphia 44, Pa.

LEEDS NORTHRUP

instruments — *automatic controls • furnaces*

Jrl. Ad ND46(13)

At least 170 thousand forest fires start each year, burning more than 15,000,000 acres of timber land. Yet much of this shameful waste could be avoided, as nine out of ten forest fires are man-caused and preventable. Prevention of future fires down through the years is primarily a matter of organization and education.

The men and management of Weyerhaeuser Timber Company are keenly aware of the necessity of protecting forest lands from fire.

In the fall of 1941, Weyerhaeuser established the first officially designated "Tree Farm" at Montesano, Washington. Dedicated to the perpetual production of trees, Tree Farm rules require that adequate protective measures be instituted against fire, insects, and disease.

Today, all Weyerhaeuser Timber Company operating forest lands are tree farms, managed by skilled foresters. This tree farming system, wholeheartedly sponsored by Weyerhaeuser, guarantees the Pulp Division's customers an assured supply of woodpulp for the many years stretching ahead in the "cellulose age" in which we live.

WEYERHAEUSER

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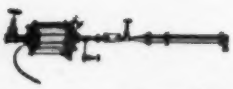
. . . Best by Test From any Angle



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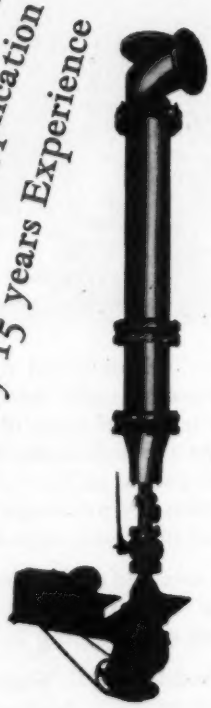

Vortrap superiority in the stock cleaning field has again been proved in recent side-by-side tests.

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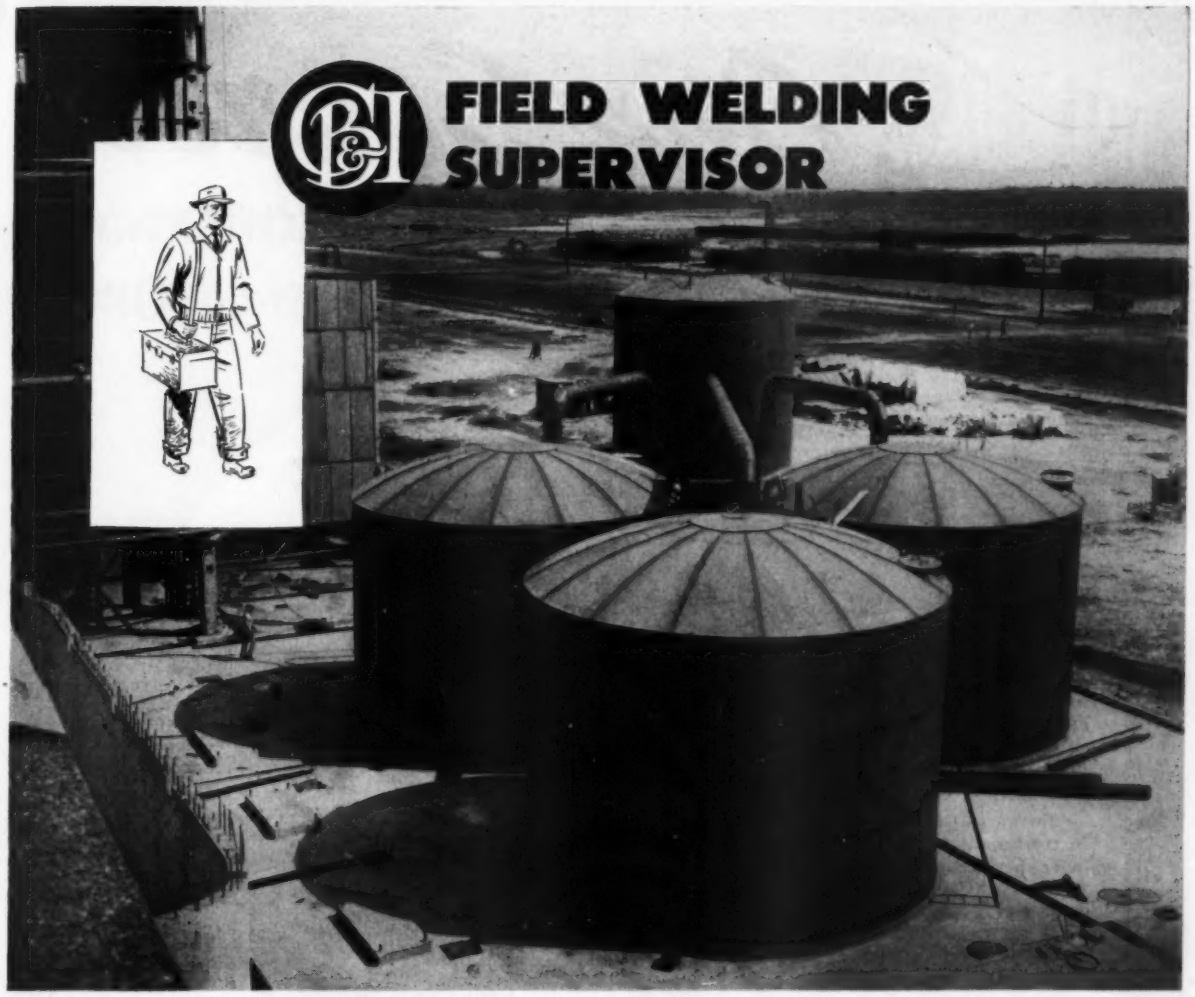

. . . makes sure Horton tanks for the pulp and paper industry meet specifications

It's his job to see that your Chicago Bridge & Iron Company welded steel tank is built in accordance with the specifications. Specially selected and trained for the job—there is a Field Welding Supervisor assigned to every welded steel structure we build. He helps make possible the high standards that Chicago Bridge & Iron Company is able to achieve . . . at *no extra cost* to you!

The Field Welding Supervisor is a welding expert and although independent of the Foreman in charge of a crew—the Field Welding Supervisor assists him in every way possible to build the structure above and beyond specifications.

Chicago Bridge & Iron Company builds pulp tanks, blow tanks, chip tanks, acid tanks, accumulators, digesters, Marx Savealls, elevated water tanks and other welded steel plate structures for the pulp and paper industry. Write our nearest office for further information, estimates or quotations.

Just a few of the Welding Supervisors' Duties

- **Supervise cutting of plugs and assist in testing and grading the plugs after they are cut.**
- **Help inspect all welding and, if necessary indicate welds to be removed and rewelded.**
- **Check welding equipment to be sure it is in top operating condition at all times.**
- **Help magnaflux, x-ray, stress-relieve, or conduct any tests called for in the governing specifications.**
- **Instruct and qualify welding operators when additional welders are needed.**

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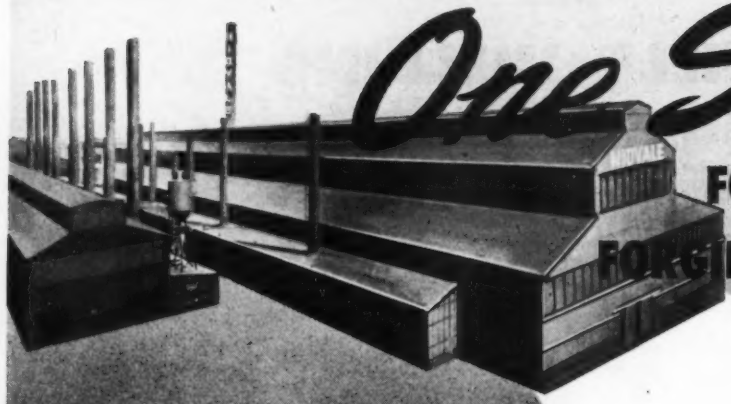
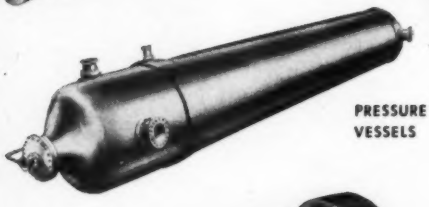
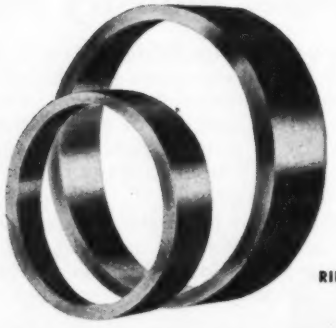


STEEL ROLLS



PRESSURE VESSELS

PRESS CYLINDER



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Name your requirements . . . show us your blueprints . . . and Midvale engineers and craftsmen working with the finest equipment will produce the forgings or corrosion and heat resisting castings you need.

Midvale can assure you of the finest in craftsmanship, precision and ultimate performance. Whether it is weldless gear rings for turbine speed reduction . . . cylinders for hydraulic presses . . . weldless high-pressure vessels for oil refining, gas reactions and steam generation or hardened and ground steel rolls for cold rolling steel, aluminum, copper, brass, zinc, foil, paper, linoleum, plastic and rubber, Midvale engineers can help you design them. Midvale craftsmen will build them to your most exacting specifications. Put your forging and casting problems in our hands . . . you'll be satisfied with the results.

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A new 40-page manual gives a detailed review of modern high-density pulp bleaching processes with HYDROGEN PEROXIDE. Steep bleaching, continuous tower bleaching, pulp dryer bleaching, paper machine bleaching and steam bleaching, as applied to various pulps, are described. 11 schematic drawings illustrate the text. Send for Becco Bulletin No. 48.

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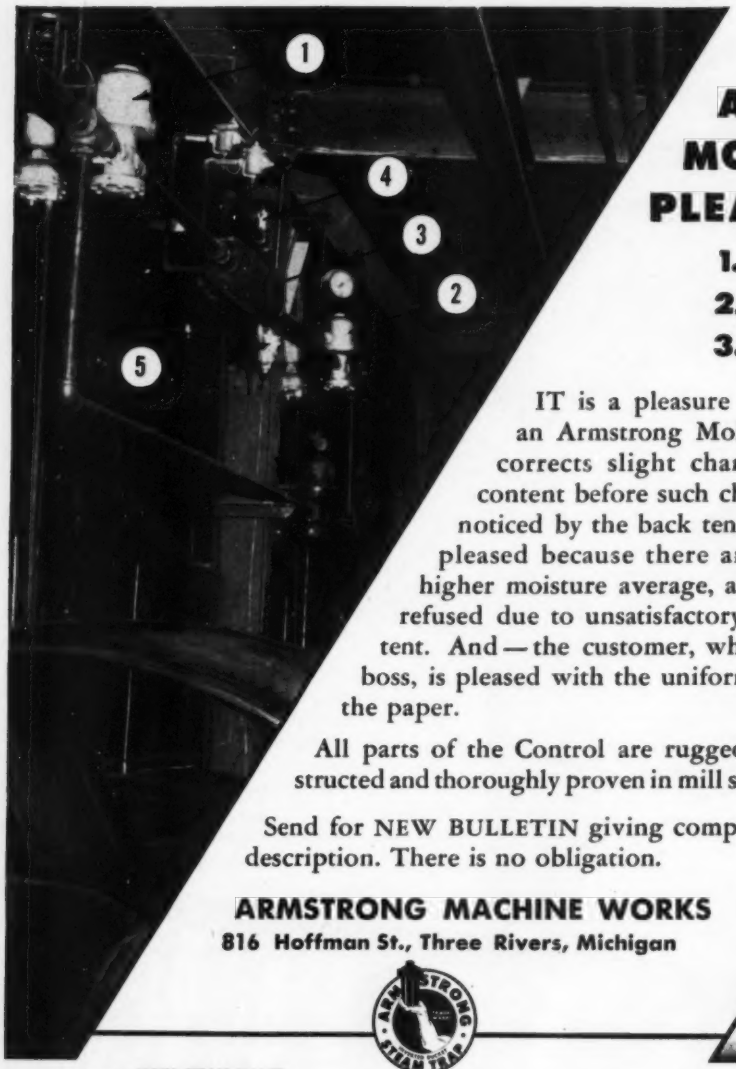

HOW THE ARMSTRONG SHEET MOISTURE CONTROL PLEASES:

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IT is a pleasure to operate machines with an Armstrong Moisture Control because it corrects slight changes in sheet moisture content before such changes would even be noticed by the back tender. Management is pleased because there are fewer breaks, a higher moisture average, and no shipments refused due to unsatisfactory moisture content. And—the customer, who is the final boss, is pleased with the uniform quality of the paper.

All parts of the Control are ruggedly constructed and thoroughly proven in mill service.

Send for NEW BULLETIN giving complete description. There is no obligation.

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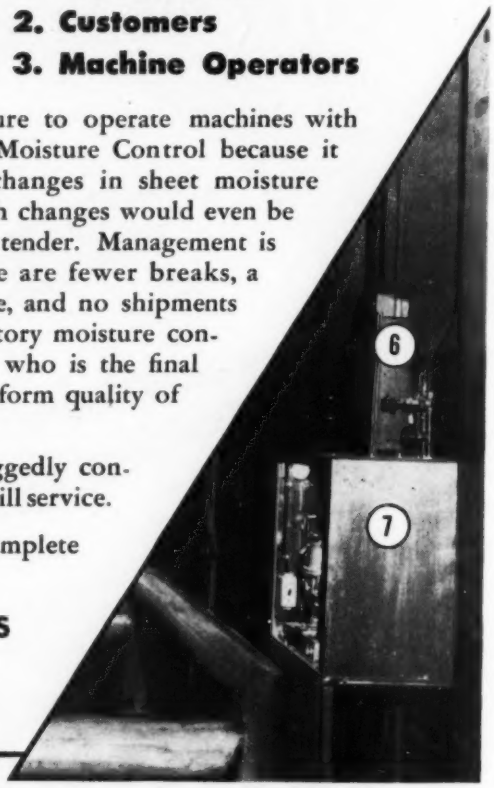

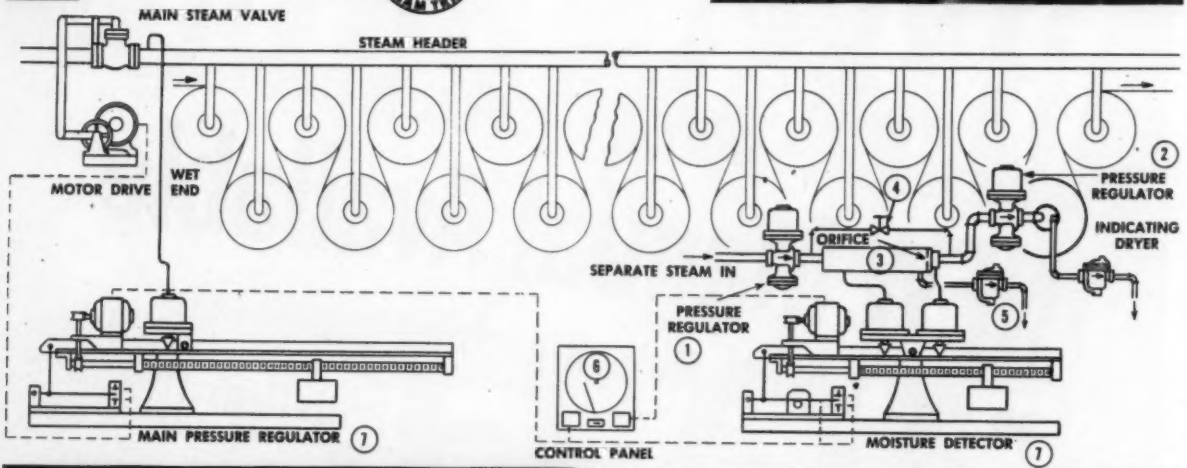

ARMSTRONG

Moisture Control Systems
Individual Dryer Temperature Controls
Paper Machine Drainage Traps
Inverted Bucket Steam Traps
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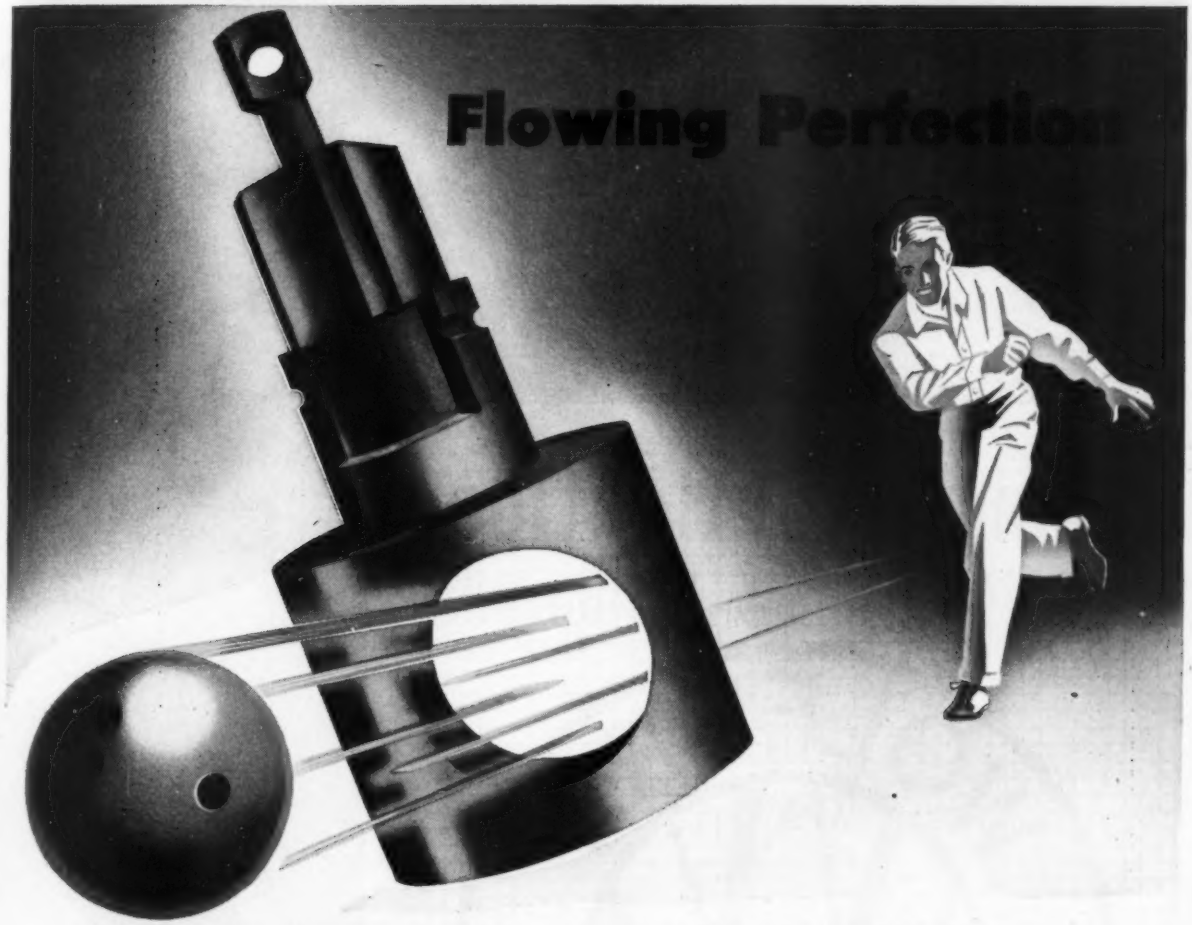

Straight through, clean as a whistle! That's the kind of *flow perfection* you get with an a.c.f. Round Port Valve. Because they're the exact same size and shape as the pipe itself, there are no obstructions. You *always* get full capacity flow of heavy viscous ladings... without loss in head pressure. There are no abrasive effects from solids in suspension.

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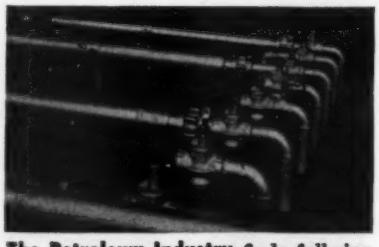
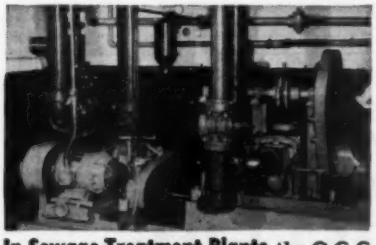


The Petroleum Industry finds full-pipe area of a.c.f. Valves of great advantage on both natural gas and crude oil.



In Sewage Treatment Plants the a.c.f. exclusive Cylindrical Plug shears obstructions, provides uninterrupted flow.

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a.c.f. CYLINDRICAL FULL PIPE AREA **PLUG VALVES**

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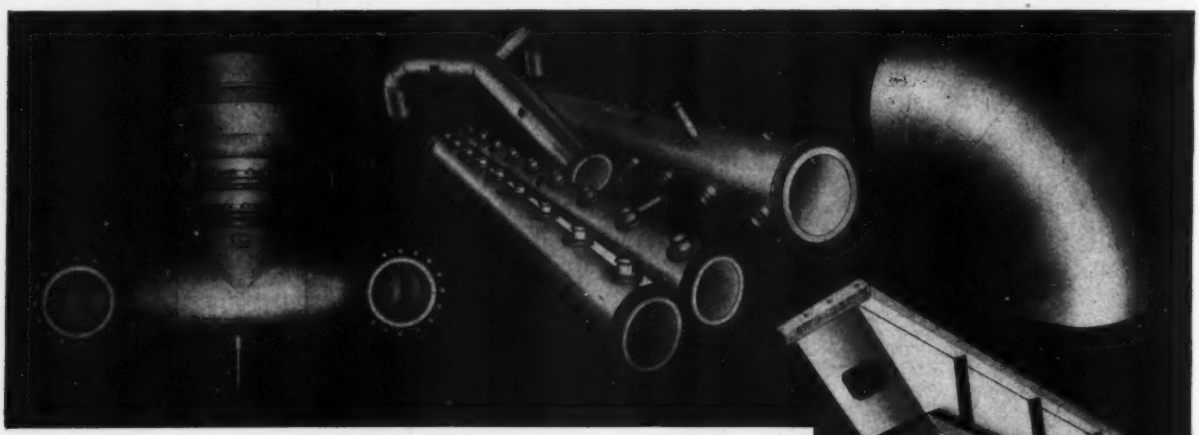
Representatives in 50 Principal Cities



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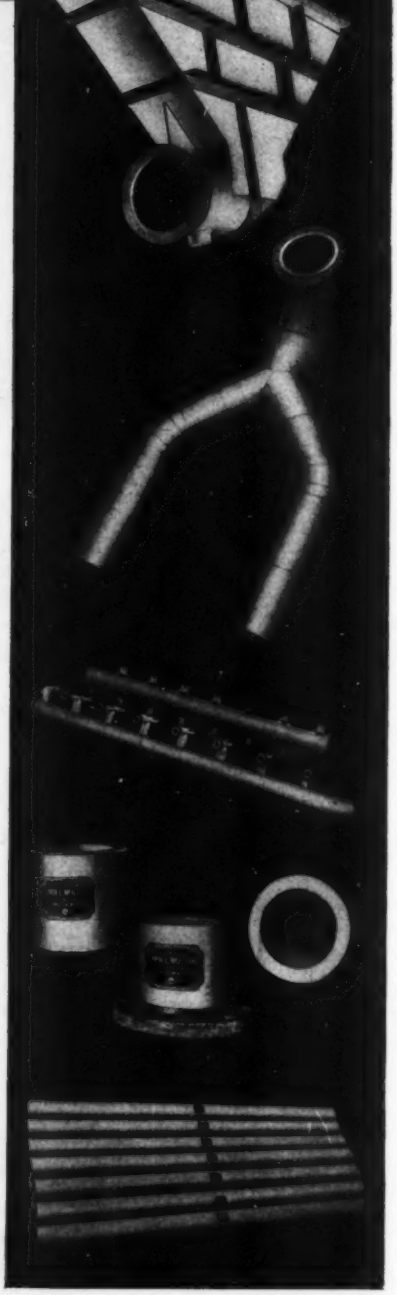

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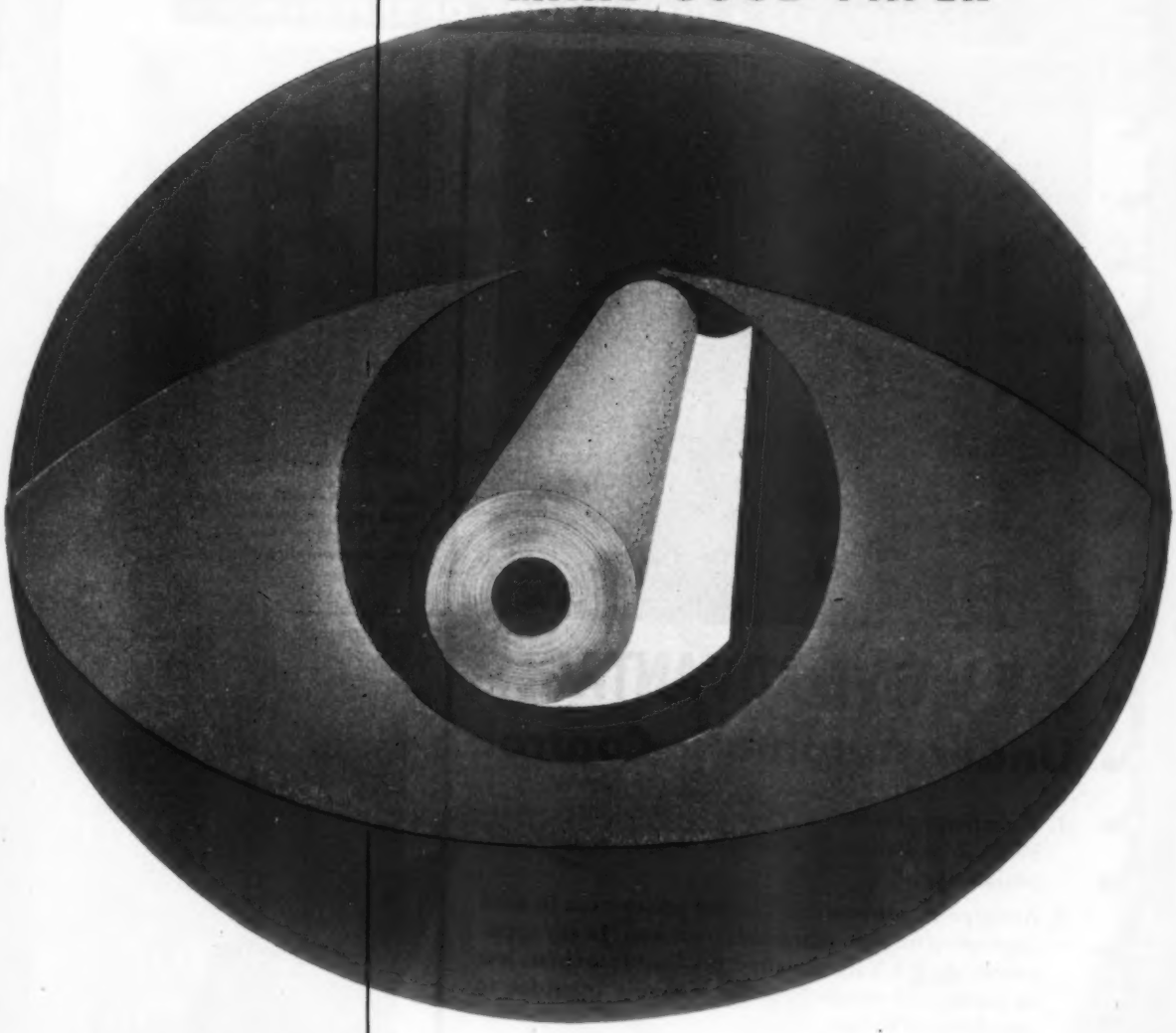

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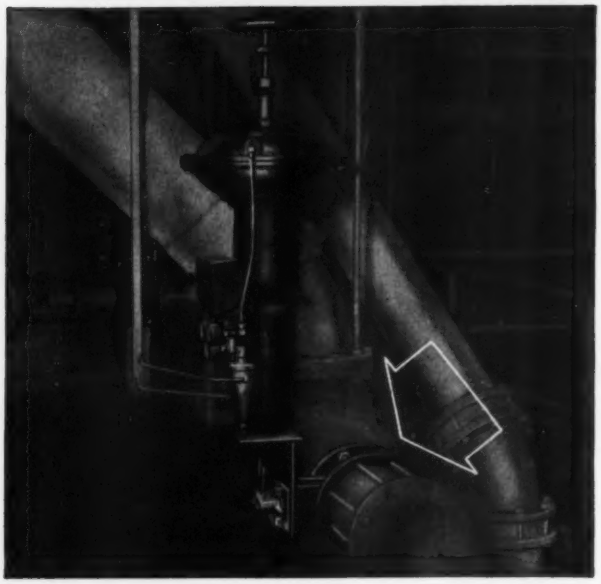

No. 677-A—1500-pound welding-end steel valve for superheated steam service. A. S. M. E. standards with heavy duty handwheel control.

R-S VALVE ADVANTAGES
Under Automatic Control

1. Wide range of throttling from open to closed position. 30 to 1 is standard. Minimum torque required for positioning.
2. Any type of instrument or control actuator can be used depending on preference and conditions. In any application, the R-S Valve usually costs less to purchase, less to install and results in lower pumping costs due to simplicity of design.
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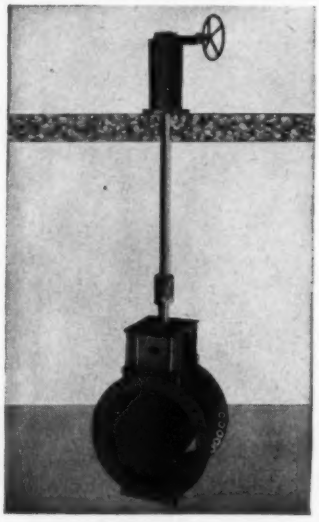
R-S Valves are used for regulation, pressure reduction, liquid level control, flow control, shut-off and other functional applications.



No. 864—50-pound valve equipped with rubber seat, extended shaft, thrust bearing, floor stand and heavy duty handwheel control.

Consult your local R-S Valve Engineers, or write direct.

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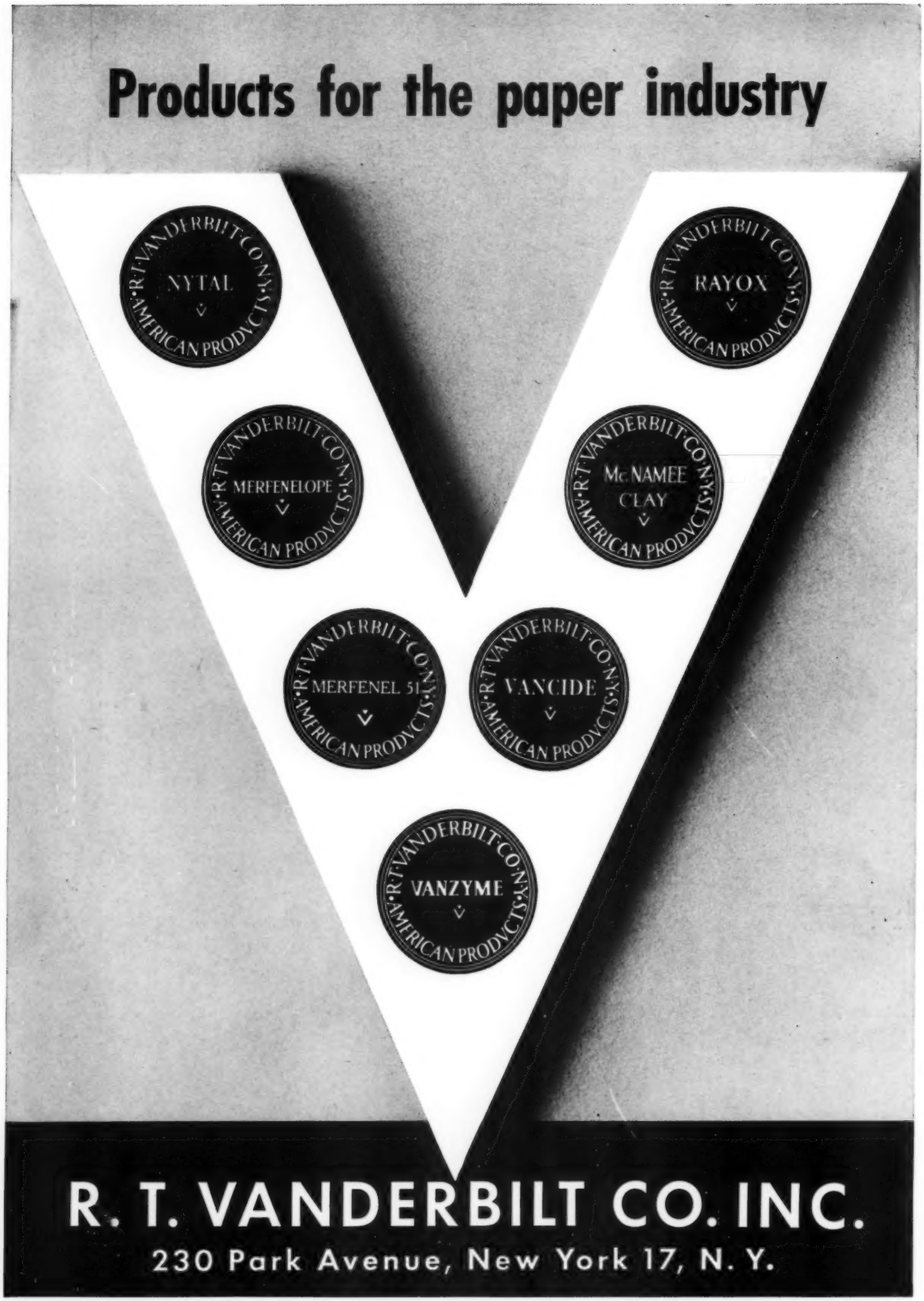
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The Paper Industry

October 1953

More paper for packaging

Paper and paperboard have already firmly established themselves as indispensable packaging materials. Currently, the packaging industry consumes about 14,000,000 tons of paper annually, with more than 30 per cent of this tonnage being used in the packaging of food products. It may be of interest to note that the volume of paper used in packaging exceeds that of all printing papers including newsprint.

The trend points strongly and unmistakably toward even greater utilization of paper and paperboard for packaging. In fact, the potentialities here seem to be limited only by the imagination of man—and man's imagination, it is said, currently creates new packaging ideas at the rate of one a week.

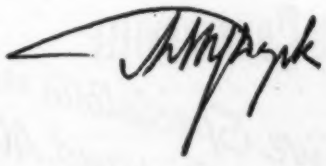
Paper is a material that cannot easily be used in "overpackaging" or, in other words, the cost of a paper package is seldom out of proportion with the value of the packaged merchandise. This is important because it guarantees sustained and general consumer satisfaction and does not merely give rise to temporary, even if sometimes spectacular, interest connected with more costly packaging materials.

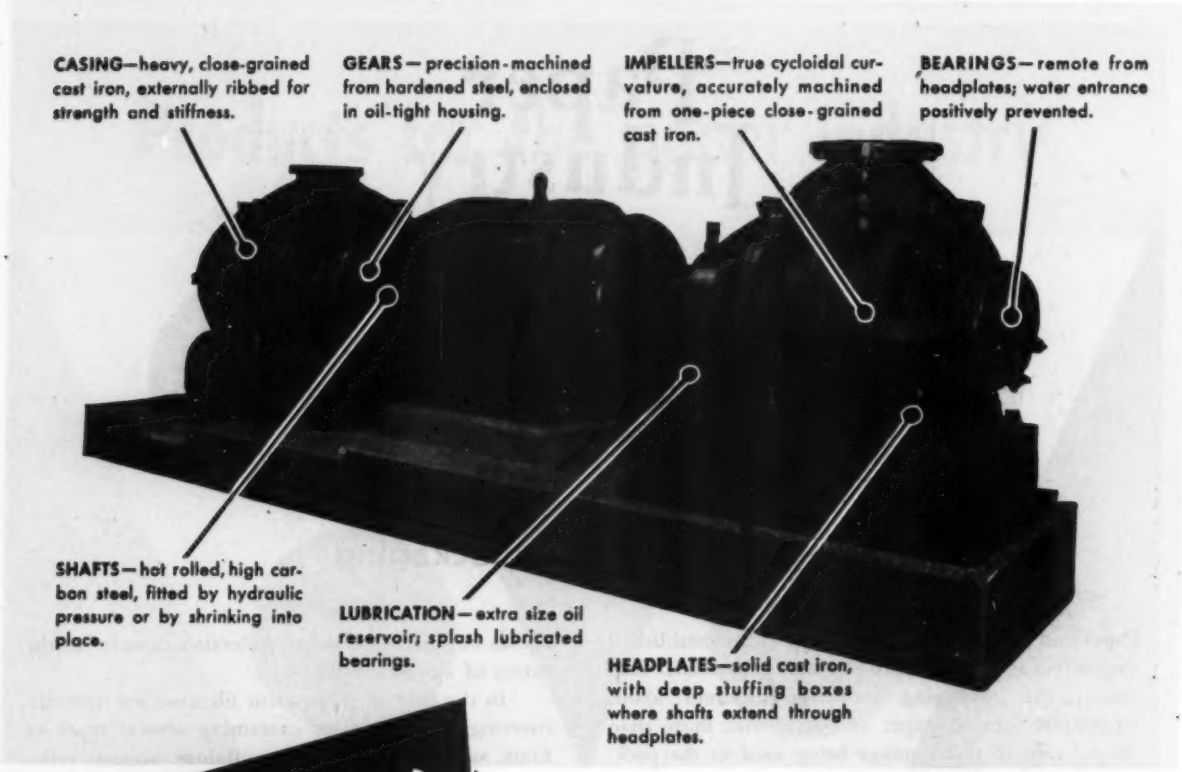
Today we are thinking in terms of moisture-vapor resistant papers, corrosion-inhibitor papers, glass-fiber reinforced papers, polyethylene coated papers, heat-sealing glassines, and glassine laminates. Greatly improved corrugating board now replaces wood in the packaging of heavy equipment such as refrigerators, stoves, radios, television sets, etc. The paper milk bottle, which as recently as 1929 appeared as an experimental curiosity, today makes annual demands on our wood pulp production capacity to the extent of almost 400,000 tons.

In the field of transparent films we are now discovering that laminates containing several types of films, such as polyethylene, cellulose, acetate, cellophane, and saran, often possess greatly improved properties over those of any single film. Thus, a laminate of polyethylene and cellophane—now used for single service packaging of concentrated orange juice—is moisture-vapor resistant, has good heat-sealing qualities, and retains good flexibility at low temperatures.

With the strong accent on the utilization of more paper and paper products for packaging, the additional 2,500,000 tons pulping capacity that will be reached in the United States during 1953 and 1955 may soon again become inadequate to supply the national demand.

The paper-products box of the future has possibilities as intriguing as those of mythological Pandora's Box; but, unlike Pandora's Box which unleashed ills upon humanity and retained only hope, the paper box is destined to bestow increasing benefits and health upon the human race.




CASING—heavy, close-grained cast iron, externally ribbed for strength and stiffness.
GEARS—precision-machined from hardened steel, enclosed in oil-tight housing.
IMPELLERS—true cycloidal curvature, accurately machined from one-piece close-grained cast iron.
BEARINGS—remote from headplates; water entrance positively prevented.
SHAFTS—hot rolled, high carbon steel, fitted by hydraulic pressure or by shrinking into place.
LUBRICATION—extra size oil reservoir; splash lubricated bearings.
HEADPLATES—solid cast iron, with deep stuffing boxes where shafts extend through headplates.

Improved Design...

BRINGS EXTRA VALUES FROM R-C VACUUM PUMPS

The specifications shown above of modern R-C Vacuum Pumps in either single stage or compound units result in these advantages:

1. *First Cost*—substantially reduced because of higher speed operation (600 rpm or more), requiring less costly motors, less expensive foundations and less floor space, because of large capacity in one pump combination.
2. *Operating Cost*—lower power consumption because of smaller sized motors; little sealing water required; low maintenance cost.
3. *Reliability*—selection of materials best fitted to specific requirements; strict adherence to improved design specifications; efficient lubrication; all adding up to rare necessity for down time.

The improved design of R-C Vacuum Pumps has resulted in an unparalleled record of reliability, low first cost and low operating expense. Together, these three basic advantages have brought frequent and enthusiastic recommendations from users to prospective users. They account for the rapidly growing list of unqualifiedly satisfied owners.

We suggest that time spent visiting these users, and consulting with R-C Vacuum Pump specialists, will prove a profitable investment.

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Competition from overseas . . . a red-hot issue . . . newsprint and the free press

Global boondoggling and the use of funds wrung from American taxpayers to finance industrial expansion abroad has come under the criticism of members of President Eisenhower's cabinet. At a recent Washington conference of senators and nationally prominent business men it was pointed out that foreign industry and commerce is being strengthened by United States money and in turn is shipping goods into this country to compete with domestic production on the American market.

While not specifically mentioned, this was an evident answer to the complaint of industries, such as the paper industry, which have resented the use of funds provided from American taxes to increase foreign competition with domestic mills.

The month disclosed further appropriations for the aid of foreign business. The Mutual Security Administration has authorized the release of approximately $3,500,000 for investment in the Austrian paper industry, which has already been given tens of millions of dollars of American money to produce paper for sale in the United States at prices below the American cost of production. Another loan by the International Bank for Reconstruction and Development has been made to a joint group of Chilean business men and the Government of Chile for the building of a paper mill to produce paper for home use and also for export. The loan is for $20,000,000.

A hard look

In discussing these problems at a joint meeting of the Citizens Advisory Committee and the Senate Banking and Currency Committee, Secretary Humphrey warned that henceforth the United States will take a hard look at any proposal to spend money for competitive enterprises abroad. Secretary Weeks of the Commerce Department said the United States must reorient its point of view toward a world that has become economically more independent. He said the time is past when this country can create strength abroad by "global boondoggling and handouts wrung from the taxpayers." A complete revision of policies of the Government's lending agencies is in prospect.

Discussion of a national tax program has become acute with the proposal for a nation-wide sales tax to take up the slack which will result from reduced individual and corporate income taxes and excess profits taxes scheduled to go into effect next year. Congressman Reed, chairman of the House Ways and Means Committee, continues vociferous in his demand that the Administration carry out its campaign pledges for tax cuts. The Treasury Department says that a national sales tax is only one of various devices being considered for the raising of sufficient revenue to meet national obligations. The tax problem will be a red-hot issue in the Congressional elections of 1954, and Democrats are already planning a campaign against what they call a policy of postponement by the present Administration. On the other hand, the Republicans defend their policy of study of issues before making radical changes in existing programs as better than a slap-happy method of making snap decisions on vital national issues.

A wave of new state legislation imposing sales taxes of various types is sweeping the nation, with the prospect that there will soon be few states which have not tried some such method of raising funds for maintenance of state governments. Michigan and Pennsylvania are typical examples of this trend, and in many cases there is a pyramiding of city sales taxes on top of state-wide taxes. Because of this trend, any proposal for a federal sales tax will be bitterly opposed by Republicans as well as Democrats.

Freedom unlimited

The special committee of the House of Representatives Committee on the Judiciary has filed a voluminous final report on the United States newsprint problem. Assistance in developing a larger domestic newsprint industry is justified by the plea that a free press is the cornerstone of our form of government, and that such a free press would be limited in its expression by a short supply of newsprint. The committee report makes the following recommendations among others: Studies of new sources of raw material such as the Alaskan forests, technical developments to accelerate the use of deinked paper, utilization of hardwoods and bagasse; special economic studies to include investment costs, production costs, profit margins and the overall price structure; an improved forest development program, and financial assistance in various forms, including accelerated tax amortization. Conversely, the report advocates steps to increase facilities for production abroad of paper for United States newspapers even though it recognizes that the United States already imports nearly 80 per cent of its newsprint consumption.

Paralleling the organization of the President's new Foreign Trade Policy Commission, the advocates of further reductions of United States tariff rates have announced their purpose to submit a detailed program to the new Commission. Among the members of the group of low tariff advocates, incorporated as the Committee for a National Trade Policy, is Thomas B. McCabe of the Scott Paper Co. Protagonists of complete free trade for the United States are prominent in this organization, and an aggressive campaign is contemplated. Meanwhile, opponents of a free trade policy are planning an equally vigorous campaign.

A partial halt

Material increases in prices of many basic grades of paper have been announced during the past month, with the average in the neighborhood of $5 per ton. The mills say that higher wage rates and costs of raw materials have forced them to seek sufficient additional sales funds to keep their balance sheets in a favorable position. Demand is high, with continuing indications that the output in 1953 will be close to a record tonnage. Rough figures indicate that the increased load of higher wages, freight rates, and raw material costs is about $15 per ton as compared with the 1951 high record of earnings, and a price increase of $5 per ton is only a partial halt to the one-sided absorption of cost increases.

Part of the increased tonnage output is accounted for by the development of new uses for new types of paper. Bathing suits made of resin-treated paper to make them water resistant indicate only a single field in which the paper industry has developed new types of paper. The basic tonnage will be, as always, the tonnage grades of printing and wrapping papers, as well as the paperboard and container field, but the feature papers, small in tonnage but profitable as a side-line, offer a balance wheel to maintain the regularity of paper mill operation.

Financial Reports

Paper mill securities dropped off during the August-September period to the lowest figures in recent months, following the general lower trend of the entire securities markets.

Net incomes

Bathurst Power & Paper Co. Ltd.—Estimated net income for the six months ended June 30 was $788,637, compared to the $1,028,383 in the same period last year.

Celotex Corp.—Net earnings in the nine months ended July 31 were $2,015,919, compared to $478,024 in 1952 (when the firm's operations were curtailed by a strike at Marrero, La.).

Crown Zellerbach Corp.—Net income for the quarter to July 31 amounted to $6,106,000, compared to the $5,148,564 for the previous year.

Great Lakes Paper Co. Ltd.—Net profit for the six months ended June 30 was $1,254,406, compared with $1,429,077 for the like 1952 period.

Kimberly-Clark Corp.—Net profit for the quarter ended July 31 was $2,195,298, compared to last year's $2,240,291.

Marathon Corp.—Net earnings for the nine months ended July 31 were $4,294,662, as against $5,652,842 in the corresponding period a year ago.

Oxford Paper Co.—Net half year income was $1,308,693, as compared with $1,326,041 in 1952.

Pabco Products Inc.—Net earnings for the fiscal year ended June 30 was $1,460,689, as against $1,608,500 for the previous fiscal year.

Powell River Co. Ltd.—Net profit for the first six months of 1953 was $4,438,328, compared with $3,650,933 in the first half of 1952.

Puget Sound Pulp & Timber Co.—Net income for the first half of 1953 was $1,357,306, as compared with $1,512,886 in the similar period of 1952.

Rayonier Inc.—Net income for the first six months of 1953 was $5,333,022, against $5,679,267 in the first six months last year.

Riegel Paper Corp.—Net earnings for

You can't buy this kind of service
...BUT YOU CAN USE IT FREE
Here is an engineering service specifically adapted to the pulp and paper industry and it's yours for the asking. Sounds simple and it is. All you have to do is phone or write a letter and immediately we put at your disposal the knowledge of our complete technical staff. Their experience is brought to you by a competent chemical engineer, a man who talks your language and knows your field. He has at his fingertips comprehensive data that will help solve operational problems involved in pulp washing, evaporation, heat exchange, lime mud washing and other unit operations. Why not take advantage of this helpful service as so many others have done?
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A Division of WHITING Corporation
Proved Engineering for the Process Industries
SINCE 1889
Pulp Washers • Evaporators
Filters • Digestor Blow Condensers
Turpentine Condensers

Electronic spacer patterns guide stockpile through sequence of cuts automatically. Responsive Oilgear Transmission provides speedy travel with pin-point stopping within 3/1000ths of an inch from zero tolerance. Lawson Cutter also used in repetitive single cuts and for trim on sides. Photo in plant of Liedtke Brothers, Chicago.

The RESULT?

Accuracy just 900% better

Production increase 50 to 500%

Over and over and over again, Oilgear Fluid Power proves to be the right solution to a drive problem. Take the case of the Lawson Cutter.

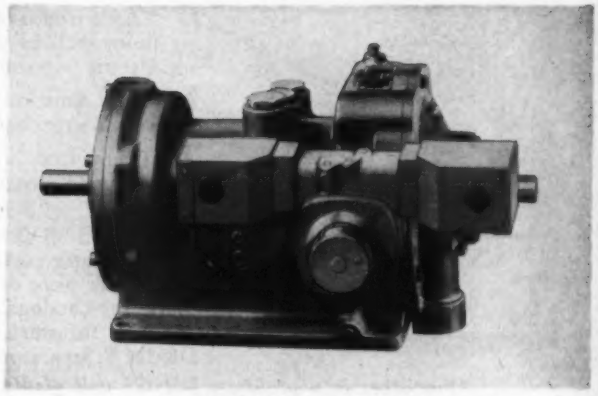
If precision is emphasized anywhere, that "where" is the field of fine color printing of every description. Money, time, effort are spent that art be right, that plates be right, that printing be right—to a hairline. And then comes the cutting operation where all that has gone before is saved—or wasted. Small wonder that cutting remained a hand operation for many years.

But the E. P. Lawson Company, manufacturer of cutting machines, wanted to modernize and mechanize the operation. Its designers turned to an electronic spacer device. This if anything would give precision in marking *where* to cut. But the next problem was to find a power drive capable of *obeying* the orders the electronic signal system was capable of *giving*. Lawson tried one type of drive. It varied all over the map. Lawson tried another type of drive. It was fairly accurate —but did not hold up.

Finally, as so many machine designers have done, Lawson turned to Oilgear. And there, as so many machine designers have done, Lawson found the answer to its problem.

The answer? Undeviating accuracy within 3/1000ths of an inch from zero tolerance—just 900% better than what had been achieved in the past; speed, translating into production increases of 50% to 500% month in and month out. How? Through the absolute responsiveness of Oilgear Fluid Power Drive to the automatic control system. Immediate, shockless acceleration to full speed "forward". Precise measured slowdown as the feed fence nears the target. Precision stopping "on target" for the cut and then rapid acceleration toward the next cut.

Here again is an example of the superlative "right-



Oilgear Two way Variable Speed Transmission as used on Lawson Electronic Spacer Cutters. These drives also provide unlimited speed range from zero to maximum. Speed changes made in split second or specified time.

ness" of Oilgear Fluid Power "generators," motors, transmissions—for almost any type of installation or machine requirement, big, little, and all those in between.

Chances are Oilgear is *the* solution you've been looking for. And Oilgear engineers will be just as quick to tell you if Oilgear is *not* for you. Ask for further information from an Oilgear Engineering Representative. No charge. No obligation. THE OILGEAR COMPANY, 1578 W. Pierce St., Milwaukee 4, Wisconsin.

OILGEAR

OILGEAR

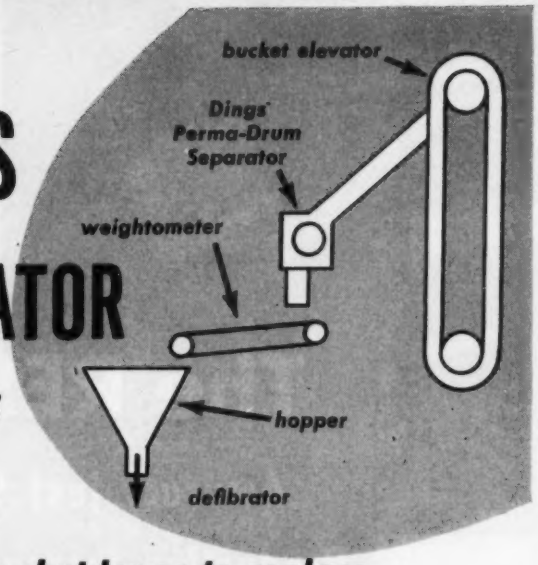
from

DINGS

to

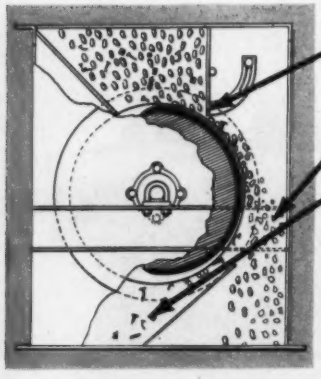
DEFIBRATOR

... an IRON-FREE FLOW



... No more shutdowns to replace iron-damaged defibrator plates at National Container Corporation of Wisconsin

Chips are chute-fed from a bucket elevator, into a DINGS Magnetic PERMA-DRUM® Separator.



Here's what happens:

1. Tramp iron is held fast to revolving drum shell by pull of stationary, non-electric permanent magnet.
2. Chips flow over drum shell in normal trajectory on way to defibrator.
3. Tramp iron is discharged separately when it passes out of magnetic field.

The DINGS "JOB SELECTED" Magnetic Separator performs this vital job as no other piece of equipment could. Write for Catalog C-1100-A for more detailed information on PERMA-DRUM® Separators.

For other iron problems DINGS will gladly recommend the right "job selected" magnetic equipment.

Other DINGS MAGNETS in Paper Mill Work ...

Non-electric permanent PERMA-PULLEY® is ideal for burden depths up to 3 inches. Electro-magnetic pulleys available for deeper burdens.

This suspended rectangular magnet is used for iron removal in a southern paper mill. Belt speed was too fast for effective use of magnetic pulley.

PD-1

FIFTY YEARS OF RESEARCH — LEADERSHIP

DINGS MAGNETIC SEPARATOR COMPANY
4762 W. Electric Ave.
Milwaukee 46, Wisconsin

Dings MAGNETS

the first half of 1953 were $768,355, as compared with $577,990 a year ago.

St. Croix Paper Co.—Net income for the half year was $508,191, as against $455,024 in the first half of 1952.

St. Lawrence Corp.—Net profit for the first half of 1953 was $2,335,283, against $3,096,989 a year earlier.

St. Regis Paper Co.—Net income for the first six months of 1953 was $7,122,208, as compared with $6,050,643 for the first half of 1952.

Scott Paper Co.—Net income in the first half of 1953 was $5,622,619, as compared with $4,916,288 in the similar period of 1952.

Sorg Paper Co.—Net income for the first half year rose to $177,225 from earnings of only $14,383 in the first six months of 1952.

Sutherland Paper Co.—Net income for the first half of 1953 was $1,500,417, as compared with $1,195,420 in the similar period of 1952.

Union Bag & Paper Corp.—Net income for the first half of 1953 was $5,150,447, as compared with $5,028,637 in the previous year.

Warren (S. D.) Co.—Net income for six months ended June 30 was $1,160,000, as against $771,000 a year ago.

West Virginia Pulp & Paper Co.—Net income for nine months ended July 31 was $7,340,000, as compared with $7,981,000 in the similar period a year earlier.

Weyerhaeuser Timber Co.—Net profit for the six months ended June 30 was $18,866,839, as compared with $19,287,624 for the same period a year ago.

Whitaker Paper Co.—Net profit for the six months ended June 30 was $303,656, as compared with $351,047 for the similar period in 1952.

Dividend declarations

American Writing Paper Corp. has declared a regular quarterly dividend of 12½ cents on the common stock and an extra of 25 cents, both payable September 25 to holders of record September 11.

Carpenter Paper Co. was to pay a dividend of 40 cents a share on common stock on September 1 to holders of record August 10.

Champion Paper & Fibre Co. has voted the regular quarterly dividend of 37½ cents a share on common stock, payable September 1 to holders of record August 11, and $1.12½ on the preferred stock, for payment October 1 to stock of record September 9.

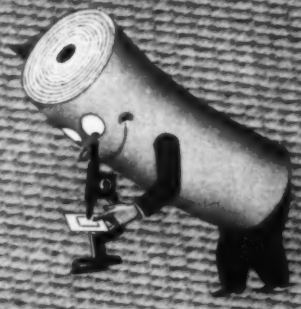
Charmin Paper Mills has declared dividends of 37½ cents on the common and 34⅜ cents on the preferred, both payable October 1 to record of September 11.

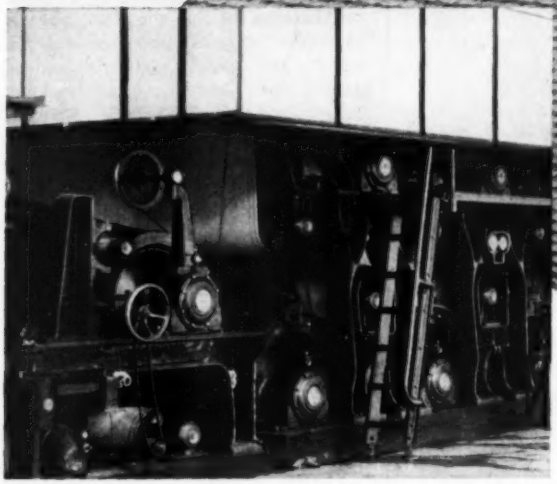
Fox Paper Co. has declared a dividend of 50 cents a share on the common,

SCIENTIFIC CONSTRUCTION* Makes The Big Difference In DRYER FELTS

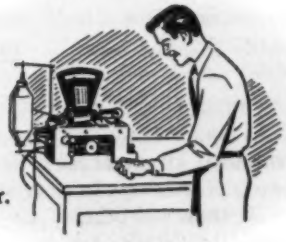
WOODBERRY 887
REINFORCED DRYER FELT

Gives You Scientific Construction





*Asbestos yarns woven into the face of Woodberry 887. Clipper Seams if desired.



Checking evenness of roving with Belger Tester.

One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

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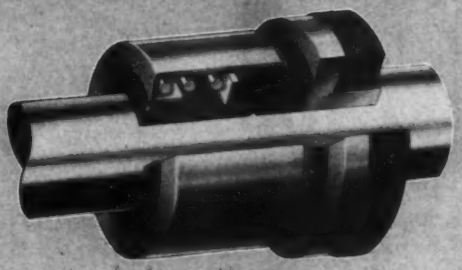
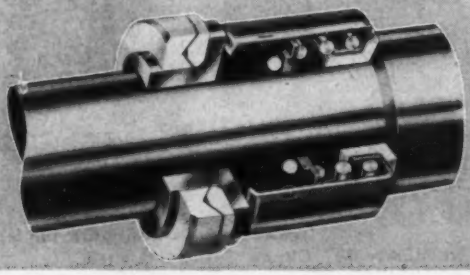
TURNER HALSEY COMPANY
Selling Agents
40 WORTH ST NEW YORK

Garlock "Package" Seals
FOR ROTATING PUMP SHAFTS

Type BB-21A—Garlock Package Seal of standard construction with brass shell, brass washer, and Buna-N bellows.



	TYPE BB-21A	TYPE AA-21A
Liquids	For water, oils, alcohol, solvents (except aromatic, chlorinated and ketone types) and other liquids (except strong acids).	For very strong acids, oils, solvents (including aromatic, chlorinated and ketone types) and all other liquids.
Equipment	Rotating shafts of centrifugal pumps, process pumps, chemical pumps, agitators and similar applications.	
Sizes	For shafts from ⅜" to 3" diameters.	
Temperatures	With Buna-N bellows up to 212°; with silicone bellows up to 450° F.	Up to 450° F.
Pressures	Up to 150 p.s.i.	Up to 150 p.s.i.



Type AA-21A—Garlock Package Seal with hat-shaped "Teflon" drive ring, brass or 316 stainless steel shell and washer, "Teflon" 'O' ring, and "Teflon" two-piece vibration ring.

✓ CHECK THESE IMPORTANT FEATURES

- ☐ Occupy very small space
- ☐ Completely assembled—ready to install
- ☐ Proven performance at low cost
- ☐ Both types are dimensionally interchangeable

In both of these Package Seals, a leakless seal is provided by a positive contact between carefully lapped metal-to-carbon mating surfaces. All metal parts in both types are available in plated-brass, Ni-Resist, stainless steel with malcomized face, Garlock "B" iron, and others.

For complete details, ask your Garlock representative or write us about your sealing problems.

THE GARLOCK PACKING COMPANY
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GARLOCK
PACKINGS, GASKETS, OIL SEALS,
MECHANICAL SEALS,
RUBBER EXPANSION JOINTS

payable September 15 to holders of record September 9.

Gair Co., Inc. (Robert) has declared a quarterly dividend of 37½ cents per share on the common stock, payable September 10 to stockholders of record August 20.

International Paper Co. has declared the regular quarterly dividends of $1.00 per share on the cumulative $4.00 preferred stock and 75 cents per share on the common stock, both payable September 14 to holders of record August 21.

Kalamazoo Vegetable Parchment Co. has declared a common stock dividend of one share for each 10 shares held, payable December 18 to stockholders of record December 1; a previous declared dividend of 25 cents was to be paid September 10.

Marathon Corp. has declared regular quarterly dividends of 30 cents a share on common stock, payable August 31 to stockholders of record August 10, and $1.25 a share on preferred stock, payable October 1 to stockholders of record September 18.

National Container Corp. has declared a quarterly cash dividend of 15 cents per share on the common stock, payable September 10 to holders of record August 20, and a regular quarterly dividend of 31¼ cents per share on the $1.25 convertible preferred stock, $25 par value, also payable September 10 to stockholders of record August 20.

Nekoosa-Edwards Paper Co. has voted a third quarter dividend of 40 cents per share, payable September 10 to shareholders of record August 27.

Pabco Products Inc. has declared the quarterly dividend of $1 per share on the 4 per cent cumulative convertible preferred stock, payable October 15 to stock of record October 1.

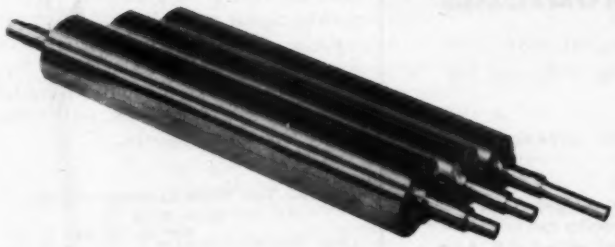
St. Regis Paper Co. has declared a quarterly dividend of 25 cents a share on the common stock, plus an extra of 12½ cents a share, payable September 1 to stockholders of record August 1, and the regular quarterly dividend of $1.10 a share on the preferred stock, payable October 1 to holders of record September 4.

Scott Paper Co. has declared a quarterly dividend of 75 cents per share on the common stock payable September 10 to shareholders of record August 26, and the regular quarterly dividend of 85 cents per share on the $3.40 cumulative preferred shares and $1.00 per share on the $4.00 cumulative preferred shares, both payable November 1 to shareholders of record October 16.

U. S. Gypsum Co. has declared a regular quarterly dividend of $1.00 per share, plus an extra of $1.50, both payable October 1 to stockholders of record September 4.

West Virginia Pulp & Paper Co. has

In Potlatch Forests' New High-Speed Mill



WELDCO ROLLS

Help Increase Production Of Bleached Kraft Paper

Today's high-speed kraft paper production calls for the finest, newest, most efficient equipment. So when Rice-Barton Corp. designed Potlatch Forests' new 196" machine, WELDCO Stainless Steel Roll Covers were specified for the Wire, Wire Stretch, and Breast Rolls.

You'll find WELDCO—Covered Rolls in many other mills, too, because they offer maximum corrosion-resistance, have superior wettability, reduce friction, increase felt life, and lessen wear on fourdrinier wires. They give years and years of economical service, with a minimum of maintenance.

Both new and old rolls can be covered with Stainless Steel, Monel, Nickel, Inconel, or other alloys, through the patented WELDCO "Pressure Welding" process. For your next machine — whether new or reconditioned — be sure to specify WELDCO Rolls. Ask your paper machinery builder about them, or contact . . .

WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY

3715 OAKWOOD AVENUE · · YOUNGSTOWN 9, OHIO

Where space is at a premium, Goulds Fig. 3115 vertical stock pump. Capacities to 2000 G. P. M., heads to 180 ft. Write for Bulletin 723.2.

Goulds Fig. 3105 heavy duty centrifugal stock pump. Capacities to 4000 G. P. M., heads to 200 ft. Write for Bulletin 723.1.

2 good answers

to stock handling problems

Illustrated you see two of the best and simplest answers to paper stock pumping problems . . . Goulds Fig. 3105 and Fig. 3115 stock pumps.

These durable performers offer you four basic advantages:

1 ***Positive even flow.*** The inlet tips of impeller vanes are designed to give a screw conveyor effect which insures an even flow and prevents water separation of the paper stock.

2 ***No jamming.*** Ejector vanes follow curvature of main vanes of impeller, preventing entrance and jamming of stock or other solid material between back impeller wall and stationary wearing plate.

3 ***Easy to adjust for wear.*** Shaft and impeller can be moved axially toward suction side plate to take up wear due to abrasives in material handled.

4 ***Easy to inspect and maintain.*** You can inspect or renew rotating element without disturbing piping connections. Ample washout connections at top and bottom of casing. Stuffing box readily accessible and stuffing box gland easily removable.

Both are especially designed to handle paper stocks of practically all kinds and consistencies. Both assure long service life with minimum maintenance.

For detailed information, specifications, performance curves, see your nearby Goulds representative, or write to Goulds Pumps, Inc., Seneca Falls, N. Y. for bulletins listed under illustrations.

MEMBER

Goulds PUMPS INC. Seneca Falls New York

declared a regular quarterly dividend of 50 cents and a year-end extra of $2 on the present common, both payable October 1 to stock of record September 15.

Paper mill corporate changes

Anglo-Canadian Pulp & Paper Mills Ltd. is expected to undertake a new preferred share financing in connection with its recent offer to Dryden Paper Co. Ltd. Anglo-Canadian called a special general stockholders meeting for October 5 to consider sanctioning the following: issue of up to 215,000 no-par value common shares to holders of Dryden stock who take up the offer; a bylaw increasing capitalization by creation of 160,000 new $2.80 par preferred shares, and issue of all or any part of these preferred shares. . . . The offer, announced in August, was $35 cash plus one share of Anglo-Canadian for each share of Dryden.

Federal Paper Board Co. Inc. and *National Folding Box Co. Inc.* have announced that Federal has concluded arrangements with certain of the principal stockholders of National for the purchase by Federal of a majority of National's capital stock. Federal has made a similar offer to purchase the minority shares held by other stockholders of National. The purchase price of such capital stock is to be $43 per share, there being 160,000 shares outstanding.

New York Stock Exchange—Stocks

	Closing Prices Sept. 21, 1953	Aug. 20, 1953
A.P.W. Products	* 2¾–3	* 3⅛–3⅝
Celotex	16⅝	16⅛
Same Preferred	* 16¼–16⅝	* 16⅛–16¼
Certain-teed Products	11⅝	12⅝
Champion P.&F. Co.	28⅛	31¼
Same Preferred	* 98–100	* 98¼–100
Chesapeake Corp.	* 26¼–26¾	* 28–28¼
Container Corp.	37⅜	39¼
Same Preferred	* 99¼–102	* 99¼–100½
Continental Diamond	* 9⅝–10	10⅝
Crown Zellerbach	28½	29⅛
Same Preferred	94	95½
Dixie Cup	35½	* 37⅛–37¾
Eastern Corp.	14¼	* 14–14⅞
Robert Gair	17	17⅜
Gaylord Container	22	22
Hammermill	12⅝	13½
International Paper	49⅜	50⅝
Same Preferred	* 95½–97	* 98½–100
Kimberly-Clark	40¼	41¼
Same Preferred	* 98–105	———
MacAndrews & Forbes	* 41¾–43¼	* 41¾–42
Marathon	17⅛	19
Masonite	16⅝	18
Mead Corp.	22¼	25½
Same Preferred	* 85–86½	* 80–89½
National Container	9¼	9⅜
Same Preferred	19½	———
Rayonier, Inc.	23⅛	25¼
Same Preferred	31⅝	* 31⅝–33⅛
Scott Paper	61¼	62¾
Same $3.40 Preferred	66½	63½
Same $4, Preferred	*102–103	*100¼–100½
St. Regis Paper	17⅝	20¼
Same Preferred	91½	* 92–93
Sutherland Paper	26½	27⅛
Same Preferred	104	105
Union Bag & Paper	38⅝	42⅝
United Board & Carton	13⅞	* 13¼–14
United Wallpaper	1⅝	* 2⅛–2¼
Same Preferred	* 16¼–17¼	* 20¼–22
U.S. Gypsum	105½	109¼
Same Preferred	165	*167½–169
West Virginia P.&P.	78	82
Same Preferred	*103½–105½	*105–106

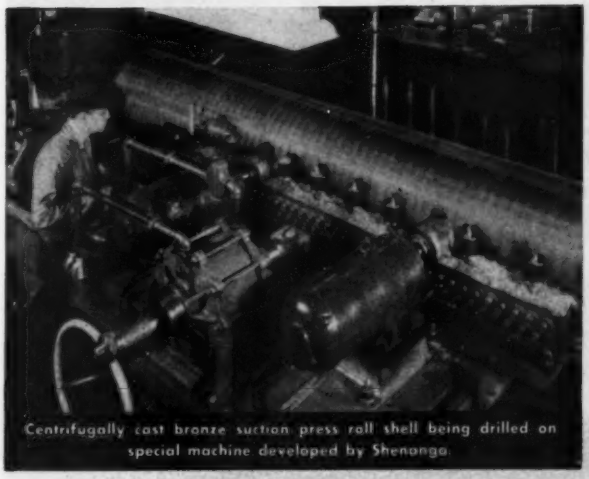
New York Stock Exchange—Bonds

Celotex 3½%	———	———
Champion P.&P. Co. 3%s	———	———
Mead Corp. 3%s	———	———

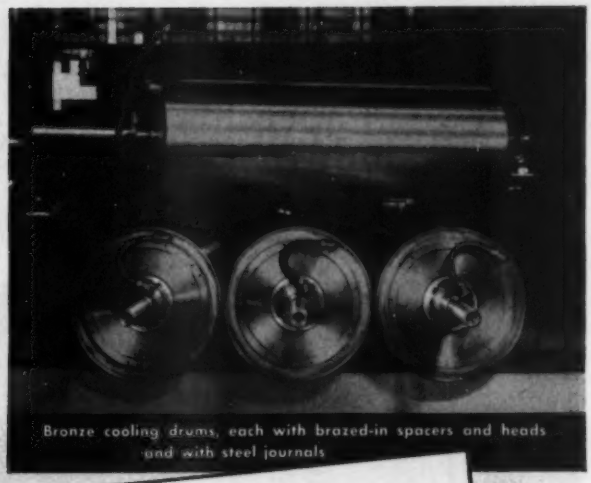
American Stock Exchange—Stocks

Am. Writing	11¼	10⅝
Brown Co. Common	7⅛	8⅛
Same $5 Preferred	———	———
Same $3 Preferred	50	000
Great Northern Paper	51½	52½
Puget Sound	———	———

* Closing Bid and Asked Prices.



Centrifugally cast bronze suction press roll shell being drilled on special machine developed by Shenango.



Bronze cooling drums, each with brazed-in spacers and heads and with steel journals

Why it pays to Specify Shenango

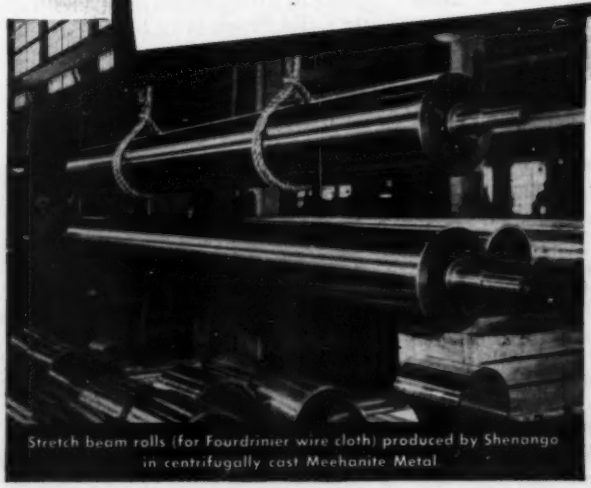
BECAUSE of Shenango's centrifugal casting process and high precision machine work, Shenango-made rolls and roll assemblies give better service, last longer and save you dollars. Centrifugal casting provides stronger, pressure-dense metal, finer, more uniform grain and freedom from sand inclusions, blowholes and other weakening defects.

Shown on this page are only a few of the many types of rolls, roll cores, drums and assemblies produced in bronzes and Meehanite Metal by Shenango for use in the paper industry.

It will pay you to specify Shenango. For further information or data on meeting your specific needs, write to: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (*Executive Offices: Pittsburgh, Pa.*).

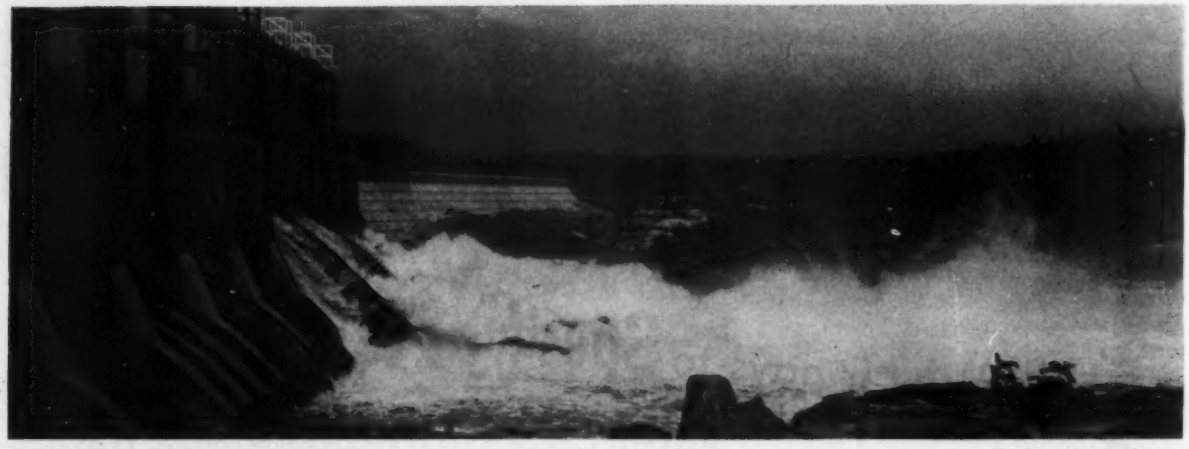
SHENANGO

ALL RED BRONZES · MANGANESE BRONZES · ALUMINUM BRONZES
MONEL METAL · NI-RESIST · MEEHANITE METAL



Stretch beam rolls (for Fourdrinier wire cloth) produced by Shenango in centrifugally cast Meehanite Metal

Bronze breast roll with steel inserts, centrifugally cast, finished and assembled in the modern Shenango shops



SURPLUS WATER flows through spillway at dam, which was primarily constructed to guarantee reserve power for Quebec North Shore's newsprint mill at Baie Comeau and to meet the growing needs of that town of 4,000 population

New Paper Mill Dam Brings Progress to "Frontier Quebec"

PRODUCING POWER from its two 45,000-hp generators, the recently completed McCormick Dam on Quebec's Manicouagan River furthers the industrialization of the rugged north shore of the Gulf of St. Lawrence. Primarily constructed to guarantee reserve power for Quebec North Shore Paper Co.'s newsprint mill at Baie Comeau and to meet the growing needs of that town, McCormick Dam will also serve to power new industries in "frontier Quebec."

This rugged region of southeastern Canada, an inhospitable wilderness of granite and bush, was developed some years ago at the instigation of Col. Robert R. McCormick, editor and publisher of *The Chicago Tribune*, who found an outlet for its vast pulpwood resources. Raw material was shipped to the Ontario Paper Co. mill at Thorold, from whence newsprint was transported to the Tribune presses.

During the depression of the 1930s, Ontario Paper established a subsidiary, Quebec North Shore, to build a modern newsprint mill serving the *New York Daily News*. In doing so, the company founded the town of Baie Comeau, today a prosperous community of more than 4,000.

To meet the needs of town and mill —the latter with the world's fastest newsprint machines—the company constructed a dam on the Outardes River 12 miles distant. This 75,000-hp source has kept mill and town supplied with electricity night and day for 15 years. However, because the Outardes was the only source of power in the remote area, the situation was hazardous. McCormick Dam has changed all that.

Giant in harness

Now, in addition to insuring reserve power for operating Quebec North Shore's newsprint machines, McCormick Dam has made it possible to heat the mill's boilers electrically, instead of depending on coal water-borne from long distances, and on pulpwood bark from which moisture had to be mechanically removed. Moreover, surplus power from the dam will be transmitted late next year by submarine cable to the south shore of the Gulf of St. Lawrence and thence to serve a mining development on the Gaspé Peninsula.

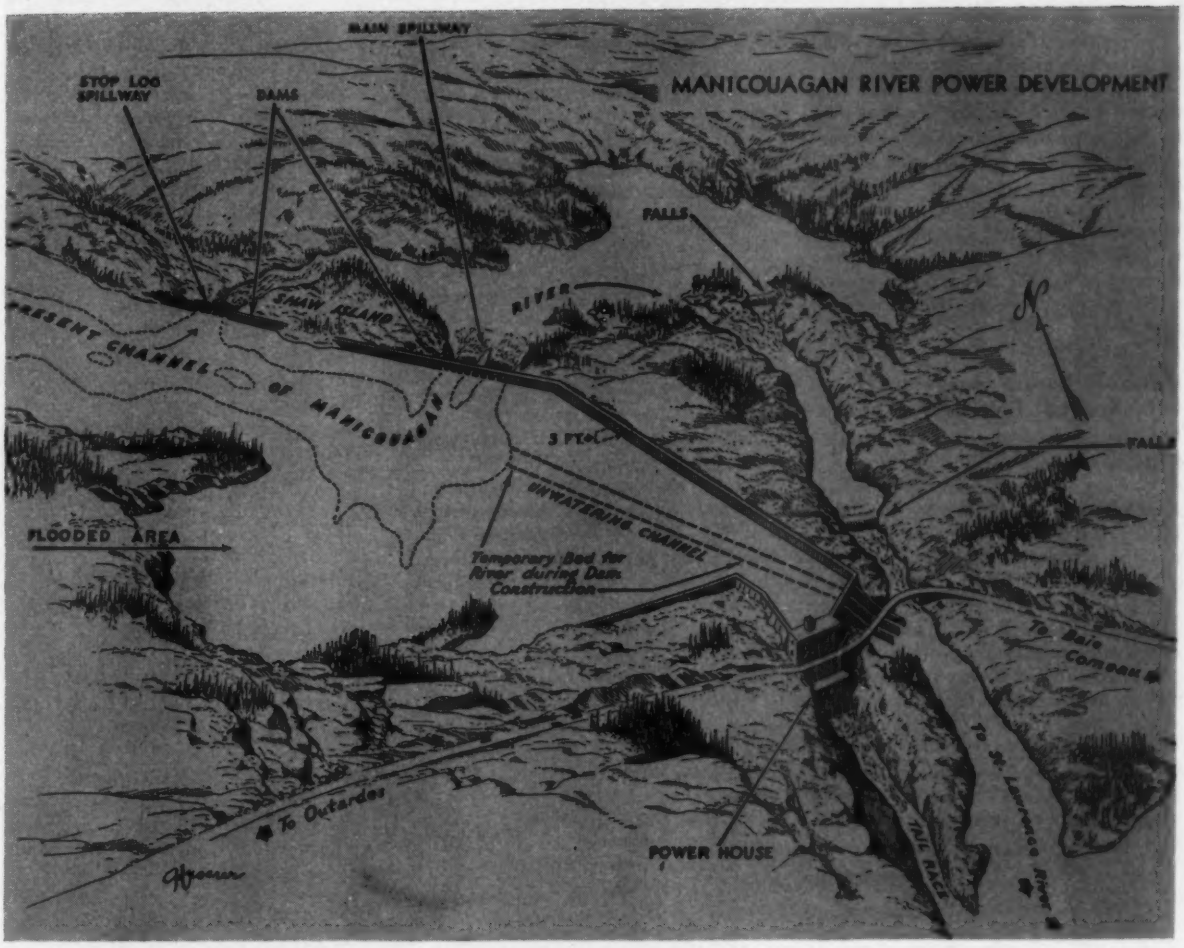
To construct McCormick Dam, it was first necessary to tame the turbulent Manicouagan. This, Quebec's third largest river, had never been harnessed be-

LEFT:

On transformer deck of new dam are (l to r): A. A. Schmon, president of Quebec North Shore; Hon. Maurice Duplessis, premier of Quebec; Col. Robert R. McCormick, editor and publisher of the Chicago Tribune, and Hon. J. Bourque, Quebec minister of lands and forests

RIGHT:

Operator at McCormick Dam adjusts the controls on the Woodward cabinet actuator



AERIAL DIAGRAM of the McCormick Dam project on Quebec's Manicouagan River; dam serves mills at Baie Comeau and Outardes Falls

fore. It rises in the northern tundra and is subject to flash floods in the spring that sometimes produce a rate of flow equal to that of Niagara Falls.

This turbulence made it impractical to use coffer dams for water diversion to provide a dry footing for the foundations. Professional engineers in charge of the project therefore designed an unwatering tunnel to carry water ⅓ of a mile under the dam site.

When rock plugs at either end of this tunnel were blasted by 18 tons of explosives, the river was not only diverted, but the site of the foundations was laid bare.

Power in 20 months

Twenty months after work was begun, McCormick Dam was producing power. There are two 56,200-hp S. Morgan Smith Co. Francis type hydraulic turbines installed; they operate under a head of 124 ft. at 112.5 rpm. These units are controlled by a double cabinet actuator manufactured by Woodward Governor Co. that has a rating of 260,000 ft.-lb. and is capable of operating the gate in three seconds. The double actuator is of the self contained type and is arranged to allow automatic starting and stopping, including automatic synchronizing, from the control room. The first of these units went into operation in December 1952, with the second being put into service one month later.

The two units at the new dam operate in parallel with two 50,000-hp hydro units at the Outardes Falls plant of Quebec North Shore, supplying power for the Baie Comeau mill, which is seven miles away. The two Outardes units also have Woodward cabinet actuators, which were placed in service in 1937. Either the McCormick or Outardes stations can regulate frequency for the paper mill; but normally the Outardes unit is on the base load for the mill, while McCormick takes care of the variations in system load.

Built in solid rock

At the peak of construction, there were 1,114 men employed. To house them, 33 temporary buildings were erected. In one month alone, the men consumed 86,609 meals in the construction camp cafeteria.

More than 250,000 yards of rock were excavated. Consumed in the work were 86,000 gal. of gasoline and 190,000 gal. of diesel fuel. Into the project went 700,000 bags of cement, 170,000 tons of crushed rock, 140,000 tons of fine and coarse sand, 1,000 tons of reinforc-

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ing steel, and 3,000,000 fbm of lumber.

Supervising the overall project was Arthur A. Schmon, president and general manager of both Ontario Paper and Quebec North Shore. The result of this active participation by management was recently summed up by Charles Miller, construction manager of the dam project and now a consulting engineer in Montreal. He pointed out that McCormick was built for only $154 per horsepower, which is the cheapest cost of any recent power development under present day needs.

National Forest Harvest Sets Record: Five Billion Feet

A record harvest of 5,160,334,000 board ft. of timber—valued at $70,616,025—was cut from national forests during the year ended July 1, 1953, the United States Department of Agriculture has announced. This is an increase of 741,824,000 board ft. over the harvest for the previous year.

Reports from Forest Service field offices indicate that much of the timber sold from national forests supplemented the incomes of persons living in the vicinity, who buy the timber and convert it into pulpwood, lumber and firewood. Of the 22,020 individual timber sales made, 20,978—or 95 per cent—were for timber valued at less than $5,000.

An additional 2,309 sales were made of forest products not measurable in board feet, such as pine gum for naval stores, Christmas trees, evergreen boughs for decorations, maple syrup and moss.

Mill Executives to Participate in Wisconsin Forestry Meeting

Milwaukee is to be the scene of the 25th Annual State Forestry Conference November 30 and December 1. Taking part in the meeting will be representatives of state and federal forest agencies, farmers, paper mill executives, and industrial forest managers. Theme of the two-day gathering will be a review of the remarkable success that has been achieved in building back Wisconsin's once oppulent forest wealth.

Teamwork between government agencies and conservation-minded citizens will be illustrated in the successful development of once almost barren timberlands for both industrial and recreational use. At a session sponsored by the state chamber of commerce all phases of the forestry program, with stress on industrial importance, will be presented.

Speakers will describe the state's approaching self-sufficiency for its paper mill pulp needs. "Wisconsin is but 25 years away from its pulp needs," according to F. G. Klip, who is in charge of woods development for Nekoosa-Edwards Paper Co. "With care and continued planting, Wisconsin can keep going forever, with its mills growing in payrolls and importance."

More than 30 speakers have been scheduled. D. C. Everest, board chairman of Marathon Corp., will review the progress of the last quarter century; Charles Sage, vice president of Kimberly-Clark Corp., the scope of the paper industry and its needs, while Folke Becker, president of Rhinelander Paper Co., will discuss the prospects of making the state self-sufficient in timber.

Other speakers will include Wisconsin's Governor Kohler; Sherman Adams, administrative assistant to President Eisenhower; Dr. Lee M. Hutchins of the U.S. Forest Service Division of Forest Pathology, and Dr. John McAndrews, chief of the forest entomology department of the State University of New York.

Consolidated WP&P to Build $360,000 Addition

Consolidated Water Power & Paper Co. will construct a $360,000 addition to the finishing department of its Wisconsin Rapids (Wis.) Division. The project will provide 600,000 cu. ft. of space.

Company officials stated that the two-story brick and steel addition is being designed to provide straight-line flow production and to meet demands for sheeted enamel paper. The finishing department's daily capacity is expected to be increased from 140 to 200 tons.

With completion of the project, operations of the department will be conducted entirely on one floor, releasing 300,000 cu. ft. on the ground floor of the present finishing department for paper storage. Construction is expected to begin immediately.

Scott Plans $1,000,000 Expansion at Oregon Mill

Scott Paper Co. of Chester, Pa., is planning a $1,000,000 expansion at Coos Bay Pulp Corp., Empire, Ore. Coos Bay is a wholly owned Scott subsidiary.

A new wood preparation building will contain a hydraulic barking machine adapted to 8-ft. lengths of cordwood and additional chipping and chip storage facilities. The expansion will enable Scott to use cordwood supplied by small woodlot owners. The firm is also at work on the possibility of using Douglas fir in its pulp operations.

St. Regis Announces $4,500,000 Expansion at Pensacola

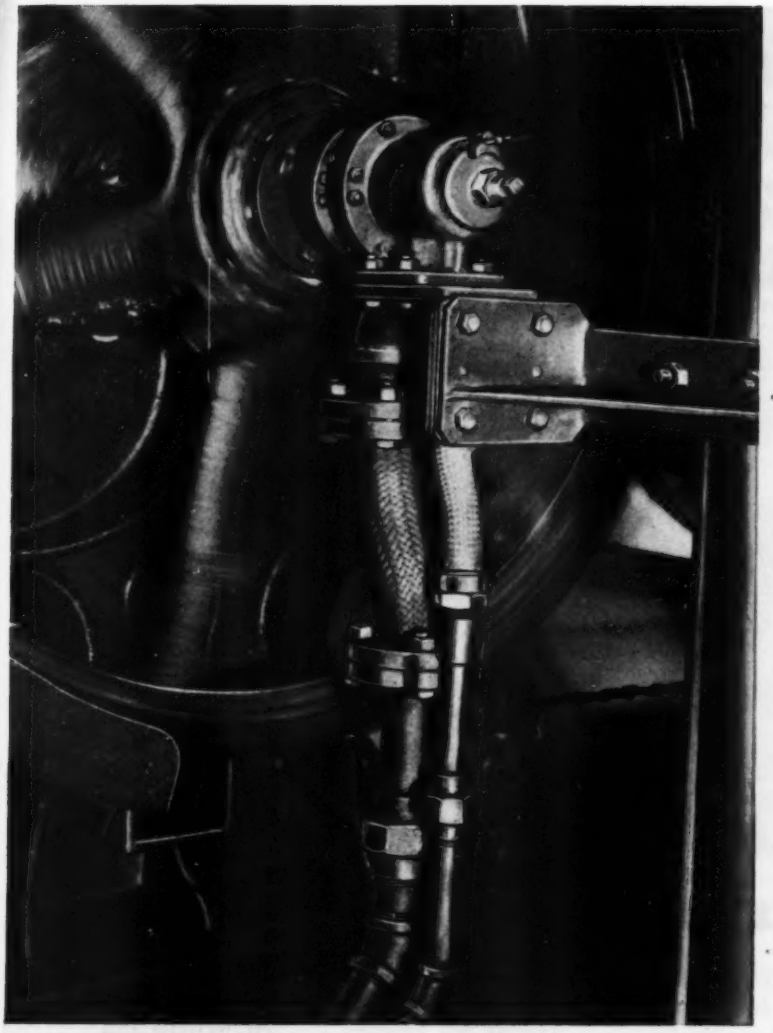
A $4,500,000 expansion program at the Kraft Center in Pensacola, Fla., has been announced by St. Regis Paper Co. The project, scheduled for completion by July 1, 1954, is designed to increase

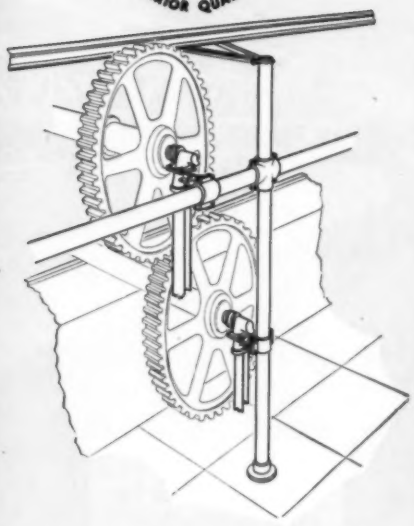
Forest Fires in the United States during 1952

	Lightning	Railroads	Campers	Smokers	Debris Burning	Incendiary	Lumbering	Miscellaneous	TOTAL
UNITED STATES	8,012	3,611	5,667	25,664	25,816	42,440	3,074	13,710	127,994
ALABAMA	159	227	442	2,773	2,017	4,011	392	933	10,954
ARIZONA*	876	-----	53	87	5	3	8	23	1,054
ARKANSAS*	126	231	87	1,347	2,103	3,250	207	334	7,677
CALIFORNIA	1,515	75	130	869	350	186	143	607	3,884
COLORADO	172	36	112	97	71	3	7	60	568
CONNECTICUT	-----	10	18	212	236	47	-----	278	801
DELAWARE	-----	30	-----	10	29	1	3	4	77
FLORIDA*	479	98	127	671	1,231	5,604	108	1,159	9,477
GEORGIA*	274	284	138	1,087	2,273	3,023	482	1,837	9,397
IDAHO	798	26	72	179	69	41	21	94	1,300
ILLINOIS	-----	104	6	216	904	191	4	112	1,587
INDIANA	1	68	8	181	365	33	10	201	860
IOWA	-----	18	17	30	13	-----	1	15	84
KENTUCKY*	2	74	211	1,018	867	435	25	165	2,797
LOUISIANA*	21	67	242	1,637	1,148	6,431	185	1,303	11,034
MAINE	209	11	70	261	158	34	64	147	954
MARYLAND	2	44	5	220	89	60	9	58	487
MASSACHUSETTS	-----	48	15	221	506	233	-----	324	1,347
MICHIGAN	10	77	107	798	555	50	15	237	1,850
MINNESOTA	10	257	97	320	328	75	15	238	1,340
MISSISSIPPI*	39	151	217	2,605	2,053	7,353	268	1,272	13,958
MISSOURI*	13	52	65	394	2,172	1,639	28	282	4,645
MONTANA	371	38	77	108	39	3	14	31	681
NEBRASKA*	22	1	1	2	-----	-----	-----	-----	26
NEVADA	5	11	27	5	-----	1	10	90
NEW HAMPSHIRE	30	22	13	141	123	30	12	88	449
NEW JERSEY	3	94	11	819	215	152	-----	55	1,349
NEW MEXICO*	472	-----	30	30	7	-----	5	9	553
NEW YORK	30	75	337	758	452	59	-----	340	1,951
NORTH CAROLINA*	119	99	358	862	1,362	797	126	296	4,035
NORTH DAKOTA**	-----	-----	-----	1	-----	-----	-----	-----	1
OHIO	1	105	20	282	335	270	13	371	1,397
OKLAHOMA*	20	2	15	157	80	661	19	31	995
OREGON	1,376	37	304	305	142	48	102	158	2,482
PENNSYLVANIA	13	303	285	461	271	83	12	138	1,555
RHODE ISLAND	-----	3	4	48	125	45	4	40	269
SOUTH CAROLINA	123	127	150	1,382	1,063	2,272	84	459	5,660
SOUTH DAKOTA	137	8	8	16	21	3	1	17	211
TENNESSEE*	32	149	933	654	1,637	2,698	159	210	6,472
TEXAS*	10	46	367	1,120	585	1,104	231	401	3,864
UTAH*	62	14	29	42	20	8	-----	27	202
VERMONT	4	11	13	36	50	8	10	29	161
VIRGINIA	42	156	106	865	627	433	13	326	2,568
WASHINGTON	283	105	348	499	429	51	119	493	2,307
WEST VIRGINIA	10	135	93	1,268	305	917	51	335	3,113
WISCONSIN	24	98	81	472	317	103	8	264	1,365
WYOMING**	109	1	44	53	6	-----	3	4	217

* Data incomplete
* Not all lands protected

NEARLY 128,000 FOREST FIRES broke out on protected lands in the United States during 1952; incendiarists caused more of these blazes—42,440—than any other group, with careless debris burners and smokers being blamed for most of the remainder; the list, based on U. S. Forest Service data, was compiled by American Forest Products Industries Inc., Washington, D. C.; no figures were available for Kansas





At left: Puseyjones Improved Steam Joint with adjustable single drop-type siphon on Dry Part having open-type gearing. Flexible pipe connections incorporated in steam and water piping compensate for expansion or contraction in supply headers or branch connections.

Above: Special outside pipe structure required for modernization of Dry Part having open-type gearing.

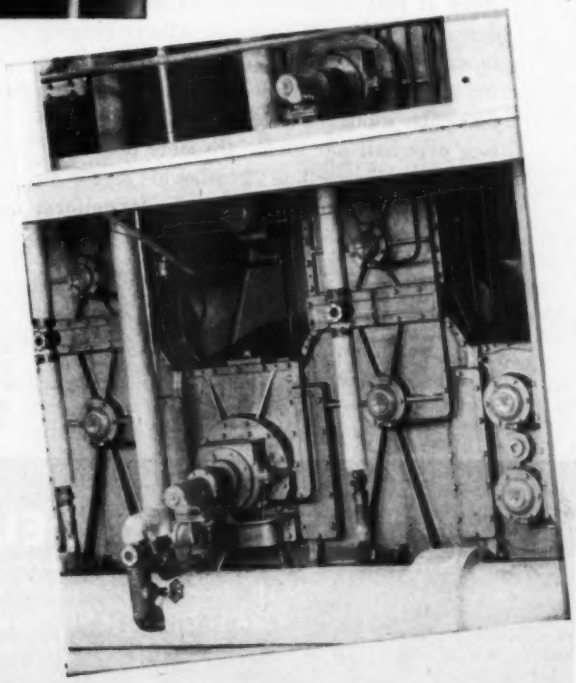
Puseyjones Improved Steam Joint with dual revolving-type siphon on new Dry Part having enclosed type gearing.

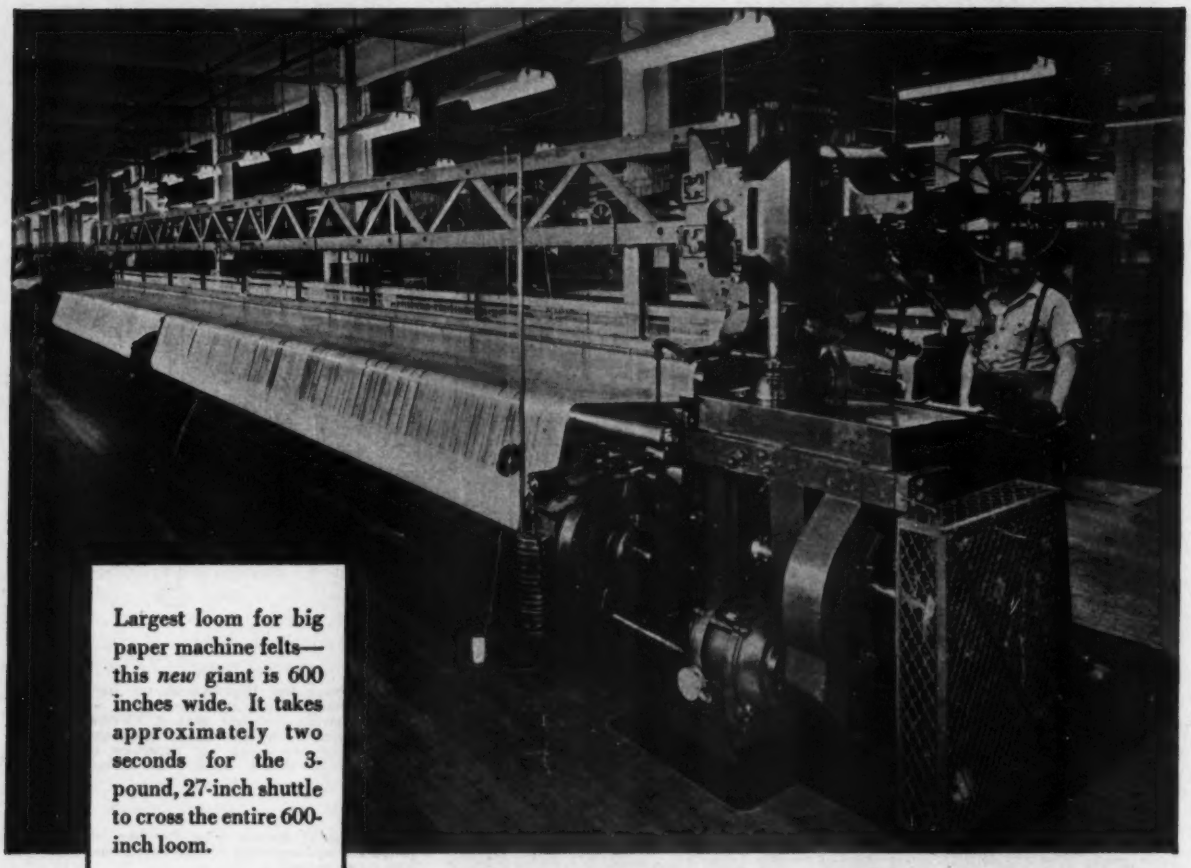
Modernize with NEW PUSEYJONES STEAM JOINTS

When condensate drainage is slow and inadequate, operating speeds and drying rate are reduced. Power losses on your paper machine may range as high as 50%.

A machine modernization program with Puseyjones Improved Steam Joints is the first step in reducing power costs, increasing the drying rate and stepping up production. Many mills have discovered the advantage of keeping drying cylinders filled with steam through efficient condensate drainage. For complete information, let us send you a copy of the "Steam Joint Bulletin." Write today or call our District Representative near you.

THE PUSEY AND JONES CORPORATION
Established 1848 : : Builders of Paper-Making Machinery
Fabricators and Welders of all classes of Steel and Alloy Products
Wilmington 99, Delaware, U.S.A.





Largest loom for big paper machine felts—this *new* giant is 600 inches wide. It takes approximately two seconds for the 3-pound, 27-inch shuttle to cross the entire 600-inch loom.

paper is our business, too!

To keep the flow of some 3000 sizes and styles of felts constantly moving through production, we have 83 looms in Albany ranging in size from 40 inches up to 600 inches. Each felt must be woven in a loom suitable for its particular width before felting to size, and therefore over half our looms are more than 200" wide. Looms exceeding 92 inches are rare in an ordinary woolen mill, but a necessity for uniform weaving of large felts.

In every operation: sorting the raw wool, scouring, blending, carding, yarn spinning, weaving and finishing . . . our facilities and processes are the most modern known to the textile industry. **Yet paper making is really our business, for every Albany felt is designed and manufactured to meet the special requirements of an individual machine for finish, drainage and trouble-free performance. The result: MORE TONS PER DAY.**

PRODUCTION SLIDE RULE. Ideal for the busy mill superintendent. Computes machine production for paper or board fast and accurately. Write for your FREE slide rule today.

ALBANY FELT COMPANY

"World's Largest Manufacturer of Paper Machine Felts"

MAIN OFFICE AND PLANT, ALBANY 1, NEW YORK

Other plants: Hoosick Falls, N. Y., North Monmouth, Maine, Cowansville, Quebec

the flexibility of the operation so that it can produce bleached and unbleached grades of kraft paper for a board variety of uses. Tidewater Construction Co. of Norfolk, Va., is general contractor.

The expansion program consists of four major phases: construction of a six-stage bleaching plant; increased water supply facilities; a screen room extension to increase screening capacity, and modernization of the No. 1 paper machine for the production of bleached fourdrinier grades. Location of the new bleaching plant will be on the No. 1 pulp mill site in the area east of the present bleaching plant.

The multi-stage bleaching system is designed so that the pulp flow can be divided and the tonnage to Nos. 1 and 2 paper machines separately treated for the grades required. Total capacity of the plant will be a daily 250 tons of pulp. Provision is made for the future installation of a chlorine dioxide stage. It will be possible to bleach pulp in the new plant to a G. E. brightness of 80 to 85 points.

Expansion of the water supply facilities includes the drilling of eight new water wells and the installation of pumps, motors, piping and storage facilities to serve them.

Extension of the screen room facilities will provide a new screening unit capable of handling a daily capacity of 150 tons of pulp production. This unit will supplement present facilities.

The modernization of No. 1 paper machine will make possible the production of heavier weights of bleached papers and board of specialty fourdrinier grades. Bleached cylinder grades of board are produced on No. 2 machine, which will also be served by the new facilities. Together, the two machines will have a broad range of weights and finishes from 50 lb. bleached kraft paper to 50 pt. bleached board.

Mando Modernizes Grinder and Power Facilities at Fort Frances

ADDITIONAL FLEXIBILITY, increased production and greater efficiency are the principal features of Minnesota & Ontario Paper Co.'s new grinder room and power facilities now being constructed at its Fort Frances, Ont., specialty paper and newsprint mill.

According to Robert Faegre, Mando executive vice president, the $5,000,000 modernization project grinds its first wood the latter part of this year, with full production to be reached sometime in 1954. Construction began during the spring of 1952.

Especially designed to meet the requirements of the company's specialty paper and building board manufacturing facilities, the grinder room will be able to produce specialty pulp and Insulite pulp from various wood species.

Pointing to increased production, J. F. MacKellar, vice president and general manager of the Canadian division, has declared that each of the 12 new grinders will have a production capacity of 30 tons of specialty pulp and more than 35 tons of newsprint pulp per day, and the new Insulite stone a capacity of 100 daily tons.

The groundwood mill is designed for a total daily production of 455 tons of pulp, an increase of 25 tons of paper pulp and 50 tons of Insulite pulp over existing grinding facilities.

13 magazine grinders

The new grinder room, constructed by Paul A. Laurence Co. Ltd., replaces three grinder rooms located in separate sections of the mill area. Fort Frances' grinding facilities are now to be housed in one building.

The facilities include 13 Shartle Bros. Machine Co. Waterous super hydraulic type magazine grinders using 4-ft. wood. These replace 43 pocket grinders using 2-ft. wood. The Waterous units are to be located in a 274- by 85-ft. steel and concrete building. Wood enters the grinder room from an overhead conveyor that travels the full length of the building.

The grinders are placed in two lines of six each, plus a single unit for the manufacture of Insulite stock. Six 5,500-hp electric motors drive the 12 stones, which are 64 in. in diameter with a 54-in. face, while an existing 3,500-hp motor drives the Insulite stone. The six motors are being supplied by Canadian General Electric Ltd.

Stock is fed to bull screens at the north end of the building by gravity flow through stainless stel stock troughs supplied by MacDonald Bros. Sheet-metal & Roofing Co. Ltd. The bull screens are of the rotary type manufactured by Port Arthur Shipbuilding Co. Ltd., having ¼-in. perforations for groundwood stock and 1-in. perforations for Insulite stock. All bull screen tanks and grinder stock pits are to be tile lined.

Major stock and white water lines consist of transite pipe with steel couplings. All main piping is confined to the basement floor and is connected to the grinders through inserts in the floor.

Power for the grinder room is to come from the firm's 110,000-volt transmission circuit and is to be stepped down to 6,600 volts through a 30,000 kva, three-phase transformer. The transformer and switches are to be located adjacent to a 78- by 20-ft. substation annex connected to the new building.

Describing the power generating facilities, Mr. MacKellar declared that one of the old grinder rooms and the power house are to be reconstructed. These will house eight vertical 2,000-hp water wheels of the propeller type supplied by Canadian Vickers Ltd. These new water wheels replace nine horizontal Francis-type quadruple runner turbines, five of which were connected directly to the grinders.

The water wheels are to be connected directly to 2,000 kva generators supplied by Canadian General Electric. Associated with the new power generating facilities is an indoor metal-clad switchgear supplied by Canadian Westinghouse Co. Ltd.

Designed for high humidity

The structural steel was supplied and erected by Dominion Bridge Co. Ltd. The metal roof deck and maroon colored G panel siding are being supplied and erected by Robertson-Irwin Co. Ltd. The siding, called "Galbestos," is especially designed for a building where a relatively high humidity is encountered. It consists of a core of sheet steel. The core is given a zinc coating, and a coat of asbestos felt is bonded to the core. Asphalt and a waterproof outer coating are then applied.

Three cranes supplied by Dominion Bridge are part of the new facilities. A 20-ton motorized crane travels along the center aisle the full length of the building. Two 16-ton motorized cranes, especially constructed to pass through the grinder magazines, are being installed for stone changing.

Ross Engineering Co. Ltd. has supplied the complete heating and ventilation system for the structure. Hot vapors from stock flumes and magazines are carried off and discharged directly outside. Heating and ventilating equipment consists of two fresh air supply units, two motor cooling units, one stock channel vapor exhaust unit, seven grinder magazine units, seven motor cooling exhaust units, and one locker room exhaust fan.

Marinette Opens New Plant

Official opening of the new converting plant of Marinette Paper Co., a subsidiary of Scott Paper Co., was to be marked September 15 with an open house. Russell M. Heath, former plant manager, and Roderick H. Sears, present plant manager, participated in the ceremony.

Weyerhaeuser Timber Company's New Kraft Pulp Mill

6600-foot rubber belt conveyor transports chips . . . new kraft pulp mill goes into production at Everett, Wash. . . . helps to achieve Weyerhaeuser's goal of using the most of every tree harvested . . . total annual payroll to 200 employees is $1,000,000

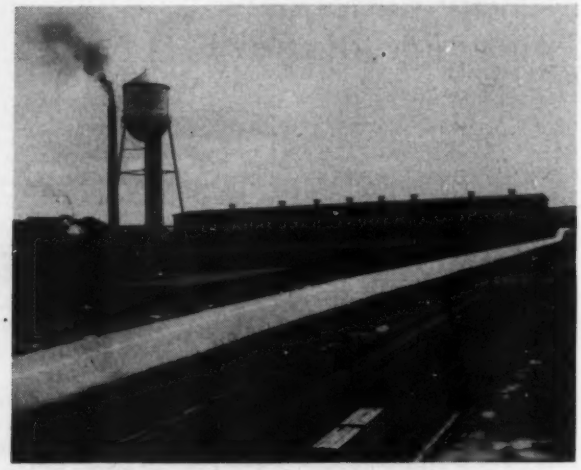
AFTER MORE THAN TWO YEARS of construction, Weyerhaeuser Timber Co.'s new kraft pulp mill at the mouth of Washington State's Snohomish River went into operation during September. Using Douglas fir chips from the firm's two Everett sawmills and from sawmills in Enumclaw and Snoqualmie Falls, the plant will produce approximately 250 tons of bleached kraft pulp daily.

The mill will operate without a single extra tree being cut from company tree farms. Chips will be produced from left-over edgings and trimmings, meaning a further step toward Weyerhaeuser's goal of using the most of every tree harvested.

The symbol of that utilization is the aluminum-jacketed Link-Belt Co. conveyor that snakes its way from Mill B's chippers to the kraft mill's chip storage silos. Longest conveyor of its type, it winds through the lumber division's plant site, ducks under the Snohomish River bridges and ends a mile and a quarter from where it began. Mill C is also connected to the system. The conveyor is fed from specially designed railroad cars that arrive at the mill daily from the Enumclaw and Snoqualmie operations.

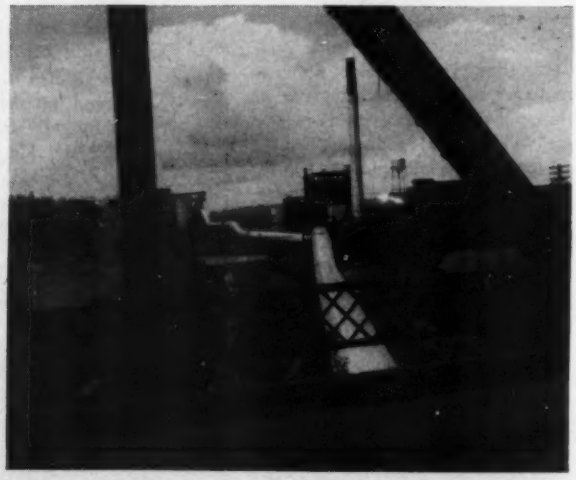
Weyerhaeuser's new kraft mill employs 200 men and women, with a total annual payroll of about $1,000,000.

NEW BLEACHED KRAFT mill at Everett, Wash.



CONVEYOR carries chips to new mill from WTCo Everett sawmill

GENERAL VIEW of conveyors by Link-Belt for chip transport



CONVEYOR SNAKES its way under Snohomish River bridges

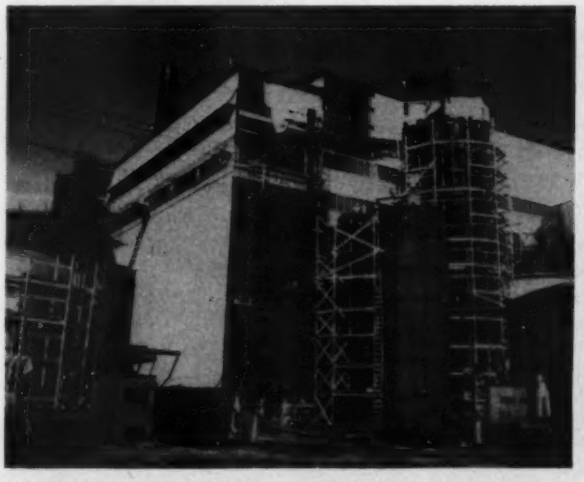
at Everett, Washington, Now in Operation . . . .

BACKED BY mountain peaks, new mill borders the Snohomish River

WATERBORNE materials are handled by U.S. Rubber belt

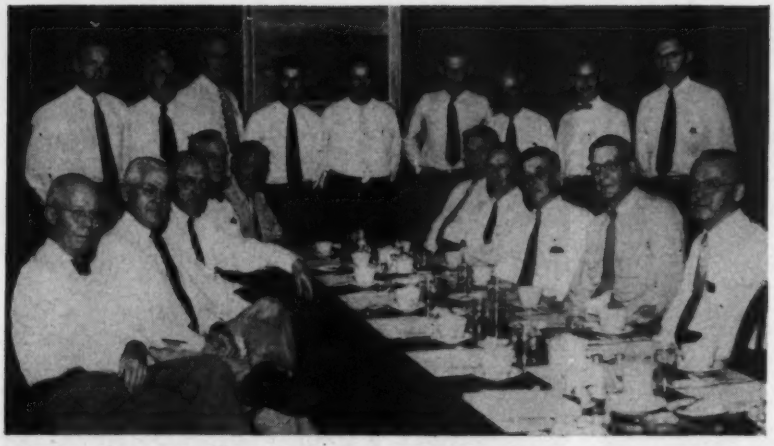
ALUMINUM JACKET protects the wood chip conveying system

SPOOLS of rubber belting await installation atop concrete pulp vat



DIGESTER BUILDING during construction at WTCo plant site

CHIP STORAGE silos fed by Link-Belt conveyor at new kraft mill



PAPER INDUSTRY EXECUTIVES and members of the University of Maine staff present at the recent meeting at which the school's Pulp and Paper Foundation was incorporated included (standing, l to r): H. W. Fales, St. Croix Paper Co.; Clifford Patch, Eastern Corp.; C. G. Paine, Eastern Corp.; Dean A. S. Campbell of the university; J. B. Calkin, consulting engineer; P. S. Bolton, Robert Gair Co. Inc.; W. E. Parsons, Keyes Fibre Co.; W. H. Chisholm, Oxford Paper Co., and L. S. Hatch, Penobscot Chemical Fibre Co.; (seated), T. F. Spear, Oxford Paper Co.; J. L. Ober, Scott Paper Co.; M. C. McDonald, Great Northern Paper Co.; F. A. Soderberg, F. C. Huyck & Sons; T. G. Mangan, International Paper Co.; R. A. Wilkins, Bird & Son; Prof. L. C. Jenness of the university; Arthur A. Hauck, president of the U of M; G. D. Bearce, St. Regis Paper Co., and Harold Holden, Eastern Corp.

Ober Becomes Chairman of U of M Foundation

J. L. Ober, vice president of Scott Paper Co. and former chairman of the executive committee of the University of Maine Pulp and Paper Foundation, was elected president of the Foundation at a recent meeting during which the organization became incorporated in the State of Maine.

Other officers of the Foundation named at the time of its incorporation were as follows: W. E. Parsons, president of Keyes Fibre Co., vice president; F. A. Soderberg, vice president of F. C. Huyck & Sons, vice president; H. W. Fales, vice president of St. Croix Paper Co., secretary, and R. A. Wilkins, vice president of Bird & Son inc., treasurer.

The Foundation was created in 1950 "to further the study of pulp and paper at the University of Maine." At the present time, 53 companies and 154 individuals have subscribed.

Schweitzer to Install New Fourdrinier at N. J. Plant

Peter J. Schweitzer Co. of New York, N. Y., has contracted with the Black-Clawson Co. of Hamilton, Ohio, for a new fourdrinier tissue machine that will be installed at its Spotswood, N. J., plant.

The unit is to be built to extremely high precision to produce cigarette and condenser tissues as thin as 0.0003 in., with a maximum tolerance of 0.00005 in. It will be the fifth such machine built by B-C for the Schweitzer organization, which operates five mills: Elizabeth, Spotswood and Jersey City, N.J.; Mount Holly Springs, Pa., and Lee, Mass.

Stone Container Acquires Full Ownership of Alabama Firm

Stone Container Corp. of Chicago has acquired full ownership of the paper mill and properties of Stone-Mann Paper Co., Mobile, Ala.

Stone, which previously held a one-half interest in the mill, has purchased the remaining interest from Seaboard Container Corp. of Bristol, Pa. The two firms had owned the property jointly since October 1950.

As a division of Stone, the mill will continue to supply boxboard to customers in the South, as well as to provide linerboard for the firm's own corrugated container plants. Stone owns other mills at Franklin and Coshocton, Ohio, and has container plants at Chicago, Philadelphia, Pittsburgh, and Mansfield, Ohio.

St. Regis Purchases Ohio Plastics Concern

Joint announcement has been made by St. Regis Paper Co. and Cambridge Molded Plastics Co. of Cambridge, Ohio, of the consummation of a contract whereby the former will acquire virtually all of the capital stock of the Cambridge firm, which operates plants at Cambridge and Richmond, Ind.

It is planned to expand the manufacturing facilities at Cambridge. When this has been accomplished, the two plants of the plastics company will be an important factor in the injection molding field, servicing those industries that are providing a steadily widening market for thermoplastic and thermosetting products.

Cambridge Molded Plastics will continue to operate under the same management, but the St. Regis Panelyte organization will act as exclusive sales agents for the firm's output.

Expansion Notes

Milwaukee Lace Paper Co.
has been sold to Smith Lee Co. Inc. of Oneida, N. Y., a manufacturer of paper products for the dairy industry. Founded in 1898, the Wisconsin firm makes lace place mats and doilies, hospital tray covers, napkins, several types of cups, jelly dishes and butter chips. Milwaukee Lace will continue operation with the present personnel.

International Paper Co.
has started work on a $2,000,000 expansion program at its mill in Camden, Ark. It will include a new cooking plant, enlargement of a finishing room, and modernization of one paper machine.

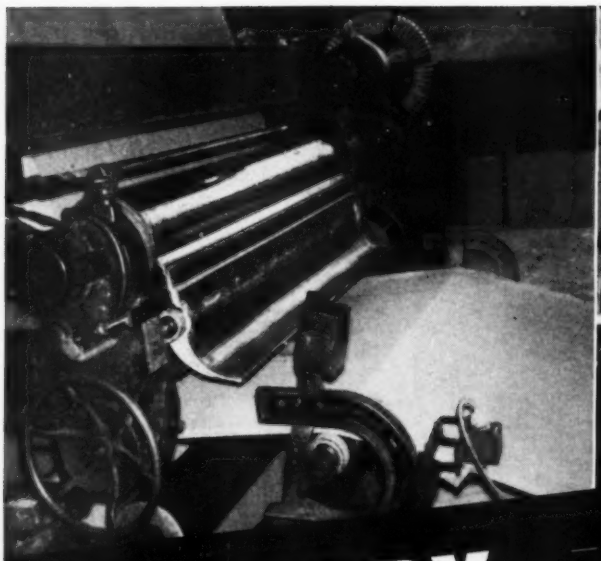
Bemis Bros. Bag Co.
will build a paper specialty plant in Crossett, Ark. The operation will be located on a four-acre site in the recently developed Crossett industrial addition and will contain about 20,000 sq. ft. of floor area.

Consolidated Won't Appeal in Massey Patent Suit

Consolidated Water Power & Paper Co. of Wisconsin Rapids will not appeal a Circuit Court of Appeals decision upholding Kimberly-Clark Corp. in the Peter J. Massey patent case. The court confirmed the October 1952 ruling of the District Court of the Eastern District of Wisconsin, in which it was stated that, "the Court is of the opinion that the defendant (Kimberly-Clark) has not infringed on the plaintiff's (Mr. Massey) patent No. 1,921,368, and that the plaintiff's patent 1,921,368 is invalid."

The case—Consolidated and Mr. Massey vs. Kimberly-Clark—began as a civil action in May 1947. Issued on August 8, 1933, to Mr. Massey, the patent expired in 1950. It covered what might broadly be termed the application of coating color by an offset printing method.

In the latest decision, it was stated that, "A careful study of the (District) Court's opinion in connection with the points urged upon this Court for reversal leaves us with the rather firm conviction that the former opinion was sound. . . . We agree with the result reached and in the main with the reason-



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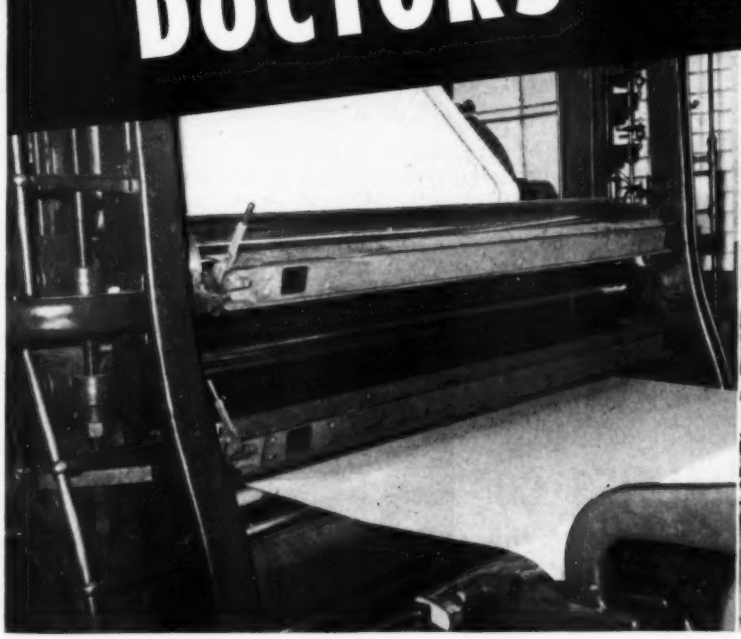
DOCTORS

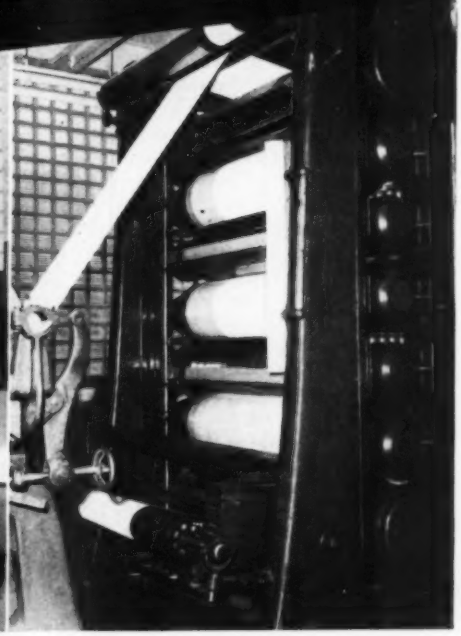
— you see them on roll after roll in mill after mill, and there's a good reason why. Vickery Doctors are carefully engineered and applied to each and every roll and to the specific conditions under which it operates.

The result is continuously efficient roll performance and minimum roll maintenance expense.

That's what good doctoring accomplishes. That's what you get when you specify VICKERY DOCTORS.

BIRD MACHINE COMPANY
SOUTH WALPOLE, MASSACHUSETTS





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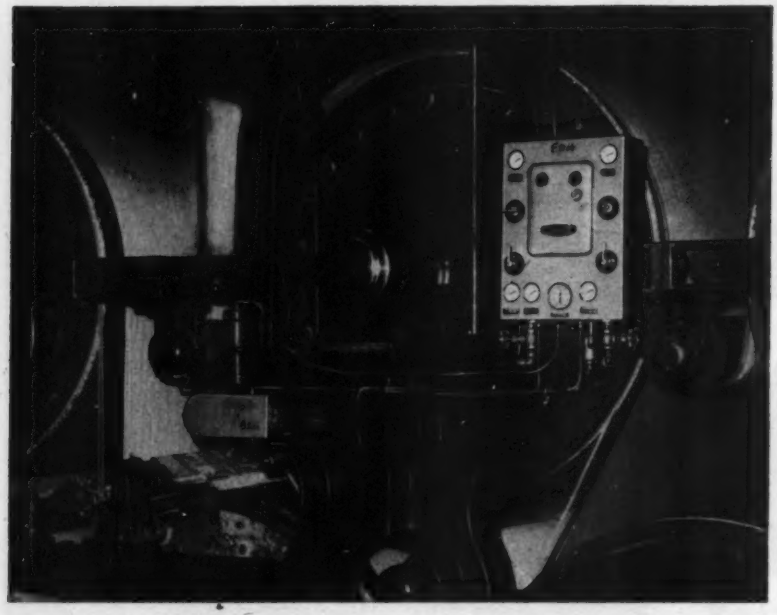
Automatic Tension and Pressure Control

FOR FASTER, EASIER, SIMPLER MOISTURE CONTROL



No hydraulic piston!

No chains, pulleys or weights!

Regulation of steam flow is instantaneous.

All gauges and controls are grouped at control panel.

Less fluctuation in steam flow to dryers.

Handles combination machines

Under actual operation in a 24-hour test, on a 33-lb. 24x36 500-basis sheet, the new Stickle control held moisture content within 3/10 of 1%.

The new Stickle Automatic Tension and Pressure Trol is a simple, compact and versatile system for faster and easier moisture control of any type of paper or paper board, regardless of machine speed.

The control automatically provides instantaneous regulation of steam flow to the dryers—without cycling or surging.

All gauges and controls are grouped at the control panel for more convenient reading and adjustments. There is no hydraulically operated piston, no mechanical linkage, no chains, pulleys or weights.

Both tension and pressure phases of the new control may be operated together, or independently. Use of the pressure control alone provides accurate regulation of steam in the dryers when paper is off the machine . . . permits control of combination machines when crepe and light tissues make use of tension roll impractical.

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ing upon which it is predicated. The situation is such that we think no useful purpose could be served by a further opinion by this court. We could hardly hope to improve upon the opinion rendered by Judge (Robert E.) Tehan (in the District Court); in any event, an attempt would be without benefit. We therefore adopt his opinion as that of this court."

Bergstrom Home Proposed as Public Museum

Establishment of a permanent public museum and art center in the home of the late John N. Bergstrom, co-founder and former president of Bergstrom Paper Co., has been proposed in Neenah, Wis., by his widow.

Mr. Bergstrom died in June 1951 and in his will left a bequest of $50,000 to the city for museum purposes. The money is to become available upon the death of the widow.

St. Lawrence Denies Merger

In a recent issue of *The Wall Street Journal*, P. M. Fox, president of St. Lawrence Corp. Ltd., has stated that "there is absolutely no truth" in the rumors and reports that St. Lawrence is contemplating a merger with, or an offer to, the Great Lakes Paper Co. Ltd.

"Such proposals have never been considered and none are contemplated," he declared. "There is no possibility of an offer of any kind being made to Great Lakes Paper Co."

N. Y. Port Authority Seeks Change in Wood Pulp Rate

The Port of New York Authority has recently petitioned the Federal Maritime Board to reconsider its decision allowing five Swedish steamship lines to continue higher rates for bringing wood pulp to Newark and New York than are charged to other North Atlantic ports.

Horace K. Corbin, chairman of the bi-state agency's Port Planning Committee, declared that the charges prevent the Port of New York from maintaining its competitive position. (The charges are $1 more per ton to New York and 50 cents more per ton to Newark.)

The petition said that the board had erred in reversing the decision of one of its examiners, who found that the rates were "unduly prejudicial and unjustly discriminatory." Involved are the Swedish American Line, the Transatlantic Line, the Helsingborg Line, the Transmarin Line, and the Wilhelmsen Line. The charges have been in effect since 1947.

The rates were imposed, according to the Port Authority, to divert freight to other ports, where steamship lines use the facilities of railroads in docking, unloading, and storing wood pulp.

LABORATORY CLERK Ron Sawkins and Harold Lacey, chemist, confer on a report

CALORIMETER test for heat value of coal is run by Bert Petch

METERMAN George Lutz adjusts a recording instrument at Kenora

STOCK TESTERS Walter Kobernyk and Keith Tanner run a freeness test

Modern Laboratory at Kenora Keeps Constant Check on Newsprint

A HOST OF PROBLEMS covering routine procedures and special assignments are handled each year by the chemists at the Kenora, Ont., control laboratory of The Ontario-Minnesota Pulp & Paper Co. Ltd. Although this lab is solely concerned with newsprint, its operation is typical of the quality control work done at other Mando plants.

Head of the Kenora lab is Harold Lacey, supervising chemist, who carries out all administrative duties. He aids and coordinates the efforts of the staff in the routine testing program and other control problems as they arise in any of the mill departments. He issues reports on the progress and conclusions reached for any problem and prepares monthly reports on different phases of plant operation, compiling information for use in cost calculations.

On duty during each shift are two laboratory testers, who work on a schedule arranged to give complete coverage on different tests. They are concerned with the manufacture and preparation of pulp—up to the time it arrives at the paper machines.

Many test results are turned out by the control staff in the course of a day. The laboratory clerk, Ron Sawkins, gathers the results and performs calculations necessary to the preparation of daily reports for operating and management guidance.

Two of the more important of these reports are the Daily Operating Report and portions of the Paper Machine Control Report. The former presents operating information for the groundwood and sulfite mills and the steam plant. It outlines each day's production, quality of product, and efficiency. For the Paper Machine Control Report, the lab provides results on the quality of the finished paper and on measurements of headbox variables.

Other data turned out include parts of the Paper Machine Daily Production Report and the Daily Pulp and Paper Production Data. The lab also prepares quality reports on roll weights, basis weight of paper shipped to various cus-

tomers, and a tabulation of culled rolls.

Tests of all types are conducted by the men of the lab. Perhaps the most important are the freeness tests, which are done at frequent intervals on samples from several points in the system, including grinder pits, groundwood flowbox, groundwood consistency regulator, and paper machine headboxes.

Trees to finished product

For uniformity of the finished sheet, consistency must be kept at a constant standard. This is done by automatic regulators. Performance of this equipment is checked continually through regular tests on samples from the groundwood and sulfite consistency regulators; on the accepted stock from the sulfite and groundwood fine screens; the groundwood knotters, and on paper machine headbox samples.

Another group of lab workers takes over once the pulp has been made into paper. These men—the paper inspectors—check each roll for proper diameter and size and possible defects as it comes from the winder. Defective rolls are culled out to be rewound, or sent to the beaters if rewinding will not correct the trouble.

The inspectors also test roll samples for basis weight, caliper, moisture and mullen strength. Additional tests such as smoothness, penetration and porosity are done in the main laboratory.

An important part of paper mill control work is the measuring and controlling of such variables as pressures, flow, temperatures and liquid levels. In the Kenora mill there are about 90 control instruments and recorders in operation to do the job.

Raw materials as they arrive at the plant come in for close scrutiny by the technicians. Lignite coal used in the steam plant is tested for moisture, ash and heat content on an Emerson Apparatus Co. fuel calorimeter. Alum, limestone, and sulfur are tested to make certain that they are up to specifications. Wood is tested for such properties as moisture and density; and in the case of spruce chips for the sulfite mill, chip size analyses are made.

The laboratory makes pitch tests on groundwood and sulfite pulp and finished paper and has carried out mill trials to test the efficiency of chemicals in preventing pitch deposit. Slime control is another responsibility of the staff. In Kenora work has been done to determine the slime condition at any given time. Slimicides that have been found effective in combatting slime growth are introduced at various points in the system.

Variety with a purpose

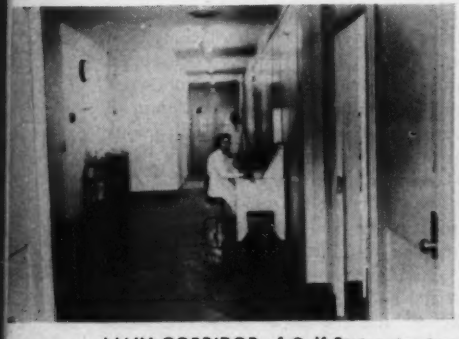
As an example of an efficient and modern laboratory, the Mando installation at Kenora shows the tremendous variety of equipment needed for the operation of an up-to-the-minute paper mill. More than 30 different kinds of instruments and equipment are in constant use.

Other laboratory facilities, with respective manufacturers in parentheses, are as follows: gloss meter, opacity meter and refractometer (Bausch & Lomb); pulp testing centrifuges, chip classifier, hydraulic sheet press and smoothness testers (Williams Apparatus Co.); sheet mold and hydraulic sheet press (Valley Iron); Taber abraser (Taber Instrument Co.); mullen testers (B. F. Perkins & Son Inc.); Elmendorf tear tester (Thwing-Albert Instrument Co.); lightning laboratory mixers (Mixing Equipment Co.); ovens (Despatch Oven Co.); analytical balances (Christian Becker Inc.), and muffle furnace (Hevi Duty Elec. Co.).

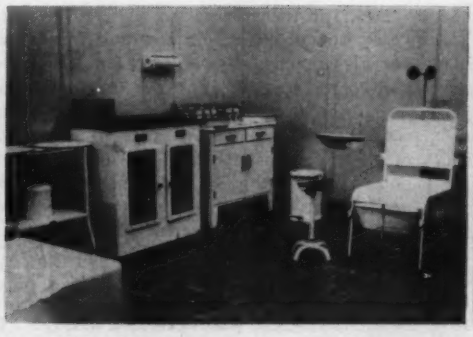
Ph meters (Beckman Instruments Inc.); Ingersoll glarimeter, incubators and ovens (Central Scientific Co.); balances (Torsion Balance Co.); basis weight scales (Toledo Scale Co.); tensile tester, fold tester and micrometer caliper (Louis Schopper of Germany); densometers and Cobb sizing tester (W. & L. E. Gurley); water bath, centrifuge and mixer (Precision Scientific Co.); petroleum testing equipment (Tagliague Mfg. Co.), and fuel calorimeter (Emerson Apparatus Co.).

Gulf States Dedicates Personnel Services Unit at Tuscaloosa

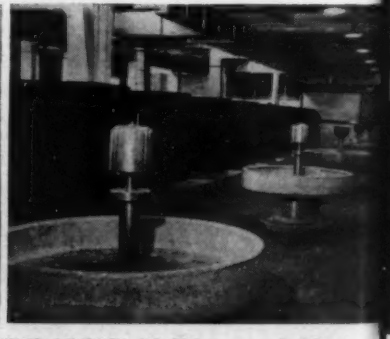
NEW PERSONNEL SERVICES building recently dedicated by Gulf States Paper Corp. at Tuscaloosa, Ala., built by Rust Engineering Co. of Pittsburgh, it is of steel and brick construction



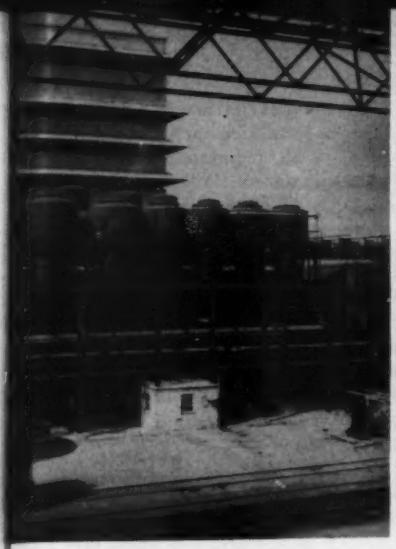
MAIN CORRIDOR of Gulf States structure; the interior finish is of glazed tile and steel panelling, with air conditioning and sound proofing throughout



ONE OF TWO treatment rooms that are equipped for almost any emergency short of a major operation; there are three sick bays, a lab, and X-ray room



MEN'S LOCKER ROOM in new building; also housed in the structure are the insurance counselor's office, and conference room and physician's quarters



MULTIPLE EFFECT evaporator utilizes stainless for tubes and vapor heads

DECKERS use stainless wire and mesh exclusively at St. Regis mill

SOUTHERN KRAFT made by St. Regis is used by Allegheny Ludlum as interleaving

Stainless Steel Big Factor in Modern Mill Construction at Jacksonville

DESIGN AND CONSTRUCTION engineers for St. Regis Paper Co. foresaw the extensive versatility of stainless steel when planning the firm's newest operation—the kraft pulp, paper and board mill at Jacksonville, Fla.

Adding 100,000 tons to St. Regis' already huge total capacity, the mill went into production early this year (THE PAPER INDUSTRY, April 1953, page 60). Key facilities were installed in great enough size so that the mill can be enlarged in the future as a further step in the company's long-range southern expansion.

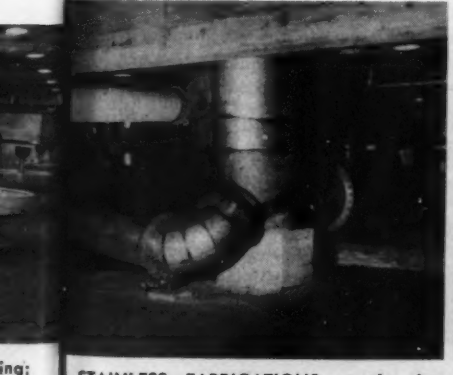
Practically every step of the production process at Jacksonville has utilized stainless steel in some capacity. The wear and corrosive resistant properties of the metal are first put to use in the woodyard and then follow the process through the plant to the fourdrinier.

Extensive use is also made throughout the chemical recovery process, where the aspect of corrosion resistance is invaluable.

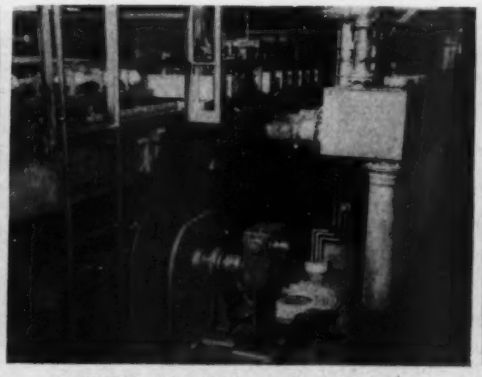
In the woodyard area, stainless wire mesh removes bark from the circulating flume water. The screens (Link-Belt Co.) are expected to materially reduce the corrosive tendency of the contaminated water acidified by the bark. The metal is next utilized in the digesters in the form of strainers, frames, and fastenings (Electric Steel Foundry Co.), which permit cooking liquor to be drawn from the digester shell for recirculation. The pumps (Bingham Pump Co.) that circulate this liquor and the check valves (The William Powell Co.) controlling the flow are stainless steel-trimmed throughout to withstand hot sulfate black liquor corrosion. At the base of the digesters—where severe conditions of erosion and corrosion exist—the blow valves (Paul Valve Corp.) are also trimmed in stainless. Vapors given off during the cooking are condensed into saleable turpentine in a Foster-Wheeler Corp. stainless steel tubed condenser.

Passing through the blow valves, the hot pulp and spent liquor enter the blow tank (Chicago Bridge & Iron Co.) under pressure. The target plate is stainless steel-clad. Again the purpose is to reduce wear and maintenance. From the blow tank the mixture is pumped to the deknotter (Improved Machinery Corp.), which is equipped with a stainless basket assembly and perforated stainless plates to remove uncooked knots and slivers. The pulp next passes onto the Impco rotary vacuum washers, with the working face of the three washer drums built up with stainless steel division strips, winding wire, face wire, and wrapping bands. The washer discharge has stainless vaned rolls, jacketed smooth roll, and stainless doctor.

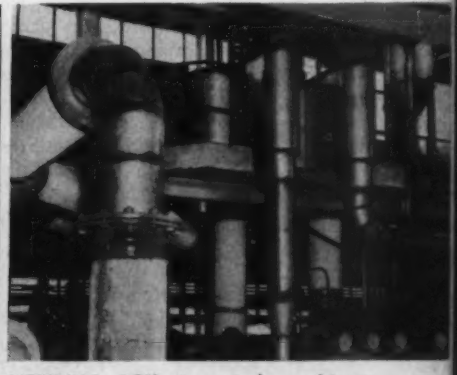
The black liquor that has been washed



STAINLESS FABRICATIONS at the fan pump; piping is stainless, stream flow valve, distributor and rising chamber are lined



BACK SIDE of fourdrinier, with suction boxes and drop leg boxes of stainless; all is supported by stainless-covered beams and ties



METERING BOX, two stock consistency regulators, and the many stainless fabricated fittings in the jordan hook-up at Jacksonville

from the pulp is handled throughout the recovery process by stainless cast and/or stainless trimmed pumps (The La Bour Co. Inc., Worthington Corp., and Goulds Pumps Inc.). The concentration of black liquor is accomplished in part by a multiple-effect evaporator (Goslin-Birmingham Mfg. Co. Inc.), which uses stainless for tubes and vapor heads in the first and second bodies. During combustion the chemicals are reduced to a smelt that is drawn off and dissolved in a Chicago Bridge & Iron tank that is equipped with stainless agitators, circulating and removal pumps and piping. The liquor not termed "green" is heated in a tank arrangement by a stainless steel steam element (W. L. Rives Co.) and moved through the storage, mixing and clarifying process in various stainless fittings by cast stainless pumps (Worthington). In the slaking, causticizing and white liquor clarifying processes the piping, feed and overflow boxes, rake mechanisms, agitators, linings and pumps (The Dorr Co. and W. L. Rives) are all of stainless steel. While the pumping and filtering equipment for lime handling (Dorr) employs stainless for miscellaneous trim.

After washing, the clean pulp passes through the first of a myriad of fabricated stainless steel fittings, inserts, pipe runs, headers, and boxes of various types. These fabrications total more than 1,400, and approximately 40 tons of stainless steel sheet were used in their manufacture.

Low friction coefficient

This material was selected primarily because of its low coefficient of friction, corrosion resistance, and resistance to slime and scale deposit, especially for stock and clarified water. Pumped from the washer chest, the stock travels through stainless steel pipe to a consistency regulator and box (DeZurik Shower Co.). This is one of five such regulators in the mill that are constructed primarily of stainless sheet and castings. Water is added, and the thin suspension of fiber is sent into a stainless header (W. L. Rives) to be distributed to the flat screen plates (Magnus Metal Corp.), also stainless. Grit and fiber bundles are removed and the screened stock passed over an Impco decker, or thickener, which also washes the pulp and utilizes stainless wire and mesh in much the same manner as the washers.

For proportioning, the stock is pumped to the stainless saveall headbox (W. L. Rives). In the saveall (Oliver United Filters Inc.), stainless is used in tubing, stuffing box sleeves, and facing wire bands. For the stock refining operation, the consistency must again be changed at the beaters and jordans by stainless regulators (DeZurik). The stock flow

100th ANNIVERSARY of Parsons & Whittemore Inc. is commemorated at a ceremony in New York, N. Y.; shown above are Karl F. Landegger (r), president of P&W, and Charles B. Delafield, president of the One Hundred Year Association; started as a small wholesale paper firm in 1853, P&W's yearly gross has risen from about $20,000 to more than $40,000,000

to the beaters is regulated through an all-stainless metering box, and the flow to the paper machine headbox (Beloit Iron Works) through a stainless stock regulating box (W. L. Rives). The stainless-trimed fan pump (Worthington) that pushes stock to the headbox has as its suction a conical stainless fabrication, is tied in with a grit removal system serviced by stainless headers, and discharges into the stainless-lined headbox through stainless pipe fabrications, stainless-lined stream flow valve, distributor and rising chamber. Leaving the headbox, the wet sheet is formed on the fourdrinier's stainless ribbed forming board, stainless deflectors, saveall pans, and drains through the wire to stainless suction boxes. All this is supported by stainless-covered main beams and cross machine ties (Beloit).

The metal is again employed at the dry end of the machine, where trim and scrap paper is repulped. Flared chutes feeding the repulper, water supply nozzles, rotor vanes and other rotor parts are constructed of stainless to increase the life of the equipment and to reduce to a minimum the necessary downtime.

To enumerate further applications of stainless steel in this modern mill would be virtually impossible, since it would include countless gauges, floats, tubing, chemical feed lines and fittings, valve and pump trim, and quantities of laboratory equipment.

In the various phases of this process, different factors have of course determined the use of stainless, but the predominant considerations are to minimize replacement, maintenance, and lost production time.

And vice versa

While stainless steel is used extensively in the papermaking processes, paper itself plays an important roll in stainless steel production. Allegheny Ludlum Steel Corp. of Pittsburgh, for instance, uses about 3,000 tons of kraft interleaving paper per year in connection with its 56-in. cold reversing rolling mill at Brackenridge and its cold mills at West Leechburg, Pa. Rolls of the paper are used to protect the smooth surfaces of stainless strip from heat and friction while the metal is being coiled, uncoiled, and recoiled in cold rolling, annealing and pickling operations.

In October of 1952 St. Regis began the development of a more durable grade of southern kraft for Allegheny Ludlum's hard usage. The result was a paper with at least four times the service life of the earlier grades, which seldom lasted for more than two or three passes because of becoming brittle from the heat of rolling. As the outcome of St. Regis research in collaboration with A-L, this much improved grade of paper has become standard in the steel firm's two Pennsylvania plants. Savings with this special grade are expected to amount to at least $75,000 annually.

Herty Tests Newsprint of Cull Wood and Pine

A new type newsprint manufactured from cull wood and pine has been given a test run "with excellent results" on newspaper presses, it has been announced by the Herty Foundation Laboratory in Savannah, Ga. The paper is composed of a combination of 40 per cent oak, 40 per cent gum, and 20 per cent pine. It was Herty's first experimental product of its own for some time.

For several years the lab has been making a series of newsprint tests for private groups. Dr. Reavis C. Sproull, lab director, declared that old and partly decayed wood was used in order to have the latest experiment go off under the worst possible conditions. According to the laboratory, pressmen were enthusiastic over the performance of the paper and were especially struck by its softness and ink absorbing qualities.

Clark Marks 50 Years

Clark Equipment Co. commemorated a half-century of operation recently with a 50th Anniversary Materials Handling Parade for directors and employees at Buchanan, Mich. Included in the procession were some 40 various industrial trucks produced by the firm.

Founded in 1903 by the late Eugene B. Clark, the firm has had a sustained growth from the beginning. In an anniversary booklet titled "First Fifty Years," George Spatta, president of the com-

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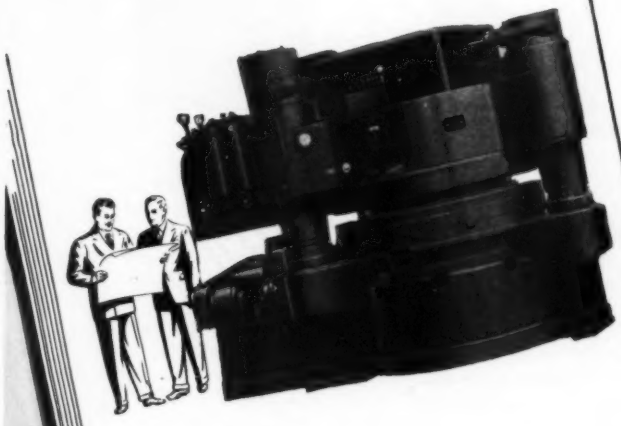
BLUE BOOK of PAPER MILLS



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Anglo-Canadian Pulp & Paper Mills, Ltd.
Gaspesia Sulphite Company Ltd.
Howard Smith Paper Mills Limited
The Ontario Paper Co., Limited
Price Bros. & Co., Ltd.
Quebec North Shore Paper Co.

UNITED STATES

Champion Paper & Fibre Co.
Marathon Corporation
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Our Responsibility

IN THE 62 years we have been manufacturing felts for the Pulp and Paper industry it has been our constant aim and responsibility to satisfy the Papermakers' requirements. In reaching for improvements our Technical and Research Departments have left no stone unturned.

We want our customers to know that whatever is new in papermakers' felts is a subject on which we can keep you fully informed. Our representatives will be glad to discuss this with you at any time.

TENAX FELTS

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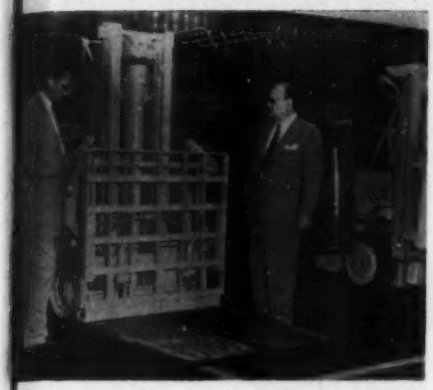


CELEBRATING THE 50th anniversary of Clark Equipment Co. at Buchanan, Mich., George Spatta (right), president, and W. E. Schirmer, vice president of the Industrial Truck Division, examine a Clark fork lift truck equipped with the latest "Pul-pac" attachment for eliminating the use of metal or wooden pallets

pany, told employees, shareholders, customers, and suppliers that "the company has grown because it has made itself indispensable to the society it serves."

The Clark payroll has grown from less than 20 persons 50 years ago to more than 7,000 today. Plant facilities, aggregating approximately 2,000,000 sq. ft. of floor space, are located in four southern Michigan communities: Buchanan, Battle Creek, Jackson, and Benton Harbor.

The impetus that propelled the firm into its present position is a product no longer manufactured by Clark—Celfor precision cutting tools.

Clark's entry into the industrial truck field was largely accidental—a result of the ingenuity and drive that went into turning out thousands of axles and wheels bought by the government during World War I. As a means of expediting war production, Clark engineers built a fleet of three-wheeled dump trucks to haul heavy loads through the plant. The development of the first Clark fork lift truck came in 1928.

Albany Felt Adds Physical Laboratory; Expands Canadian Capacity

Albany Felt Co. of Albany, N.Y., has announced that its new mechanical and physical research laboratory is to be ready for use this fall. The lab will supplement work now being carried out in the chemical research laboratory and other projects initiated under the firm's auspices at the Mellon Institute.

Directing the operation in the new facility will be Harold F. Hedberg, assistant vice president. Some of the projects scheduled for further advancement relate to the use of synthetic fibers in paper machine felts, chemical treatments, weave design and improved methods of manufacture and quality control. In accordance with long-established company policy, the physical laboratory will cooperate with the paper industry on research projects for the purpose of improving felt performance.

Canadian Expansion

After eight months of operation, the plant of Albany Felt Co. of Canada Ltd. at Cowansville, Que., is embarking on its first expansion program.

The company has recently ordered and is awaiting delivery of a new 600-in. Crompton & Knowles Loom Works felt loom, the largest ever built for a Canadian mill; a custom-built Riggs & Lombard Inc. double-sided rotary fulling machine, and other new equipment.

Officers of the Canadian subsidiary include: Lewis R. Parker, who is executive vice president of the parent concern, chairman of the board; John C. Standish, president; Z. J. Chagnon, executive vice president, and James G. Reaser, treasurer. The superintendent is to be Spencer Standish, while his assistant and chief designer is Harold Fabricius.

The parent firm has been established in the United States since 1895 and is the largest manufacturer of paper machine felts in the world. U.S. plants are located in Albany and Hoosick Falls, N.Y., and in North Monmouth, Maine.

Allied Notes

S. Morgan Smith Co.

of York, Pa., largest manufacturer of hydraulic turbines in the country, has announced that the first phase of its plant expansion has been completed at a cost of approximately $2,850,000. The project has boosted productive capacity some 20 per cent. The company plans eventually to construct four similar plants on the tract.

Minneapolis-Honeywell Regulator Co.

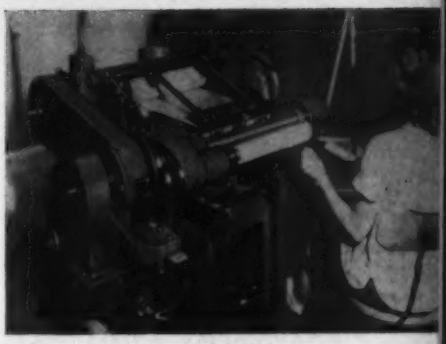
has reported the introduction of a series of individually engineered control systems as "packaged" units to provide automatic control of various industrial process operations. The packaged systems will enable a processor to select an instrumentation system on the basis of over-all function.

D. J. Murray Mfg. Co.,

Wausau, Wis., has announced appointment of two sales representatives. John Hawe Co. of St. Paul, Minn., will cover Minnesota and North and South Dakota. Mac-Knapp Co. of Chicago will handle sales in northern Illinois and northern Indiana.

Lukens Steel Co.,

Coatesville, Pa., announces that it is producing a special steel of the "rimming" type for use by the paper and pulp industry in sulfate digesters. The steel combines the desirable qualities of the rimming steels used in digester years ago with characteristics needed for easy fabrication of heavy gauge metals.



MACHINE FOR CONTINUOUSLY winding small diameter rolls that was developed some years ago by Crystal Waxing Co., a subsidiary of Crystal Tissue Co. of Middletown, Ohio; patent coverage has been allowed, and the unit is to be made available to paper converters by The Black-Clawson Co. through its Dilts Machine Works Division at Fulton, N. Y.; the winder is shown in operation winding 2¼-in. diameter rolls of 12-in. width waxed paper at 1,000 fpm

American Cyanamid Co.'s

Paper Chemicals Department plans to open a sales office in a new building recently completed in Portland, Ore., by the Lederle Laboratories Division. It is thought that the office will be moved from its present Seattle location sometime next year.

Vanton Pump Corp.

of New York, N.Y., has officially changed the corporate name to Vanton Pump & Equipment Corp. It has also announced that the Vanton plant has been moved from Long Island City to a new building on the premises of the affiliate company, The Cooper Alloy Foundry Co., Hillside, N.J.

Whiting Corp. (Canada) Ltd.

plans to establish its own facilities for production in Canada. For some time the firm's products have been made in Canada under arrangements with other firms. The company, affiliated with Whiting Corp. of Harvey, Ill., has bought seven acres in Toronto's Rexdale development.

CECIL A. POTTER, president of Machinery & Engineering Corp. of Westminster, Mass., has been named general manager of B. F. Perkins & Son Inc. of Holyoke.

WILLIAM J. THOMAS, general sales manager, has been named general manager of the Tubular Products Division of The Babcock & Wilcox Co., and

W. J. Thomas

P. J. Utnehmer

E. W. Lundy

R. H. Hull

PAUL J. UTNEHMER, works manager, has been named to the division's board of directors.

J. C. MERWIN has been elected chairman of the board of Chain Belt Co. Succeeding him as president and chief executive officer is *L. B. McKNIGHT*, who has been executive vice president since 1951.

EVERETT W. LUNDY has been named assistant sales manager of the Peerless Pump Division of Food Machinery & Chemical Corp., Los Angeles. He is to be succeeded as Pacific district manager by *ROBERT H. HULL*. Mr. Hull was formerly the central district manager at Indianapolis.

F. A. STROVINK has been named assistant manager of the eastern region of American Cyanamid Co.'s Paper Chemicals Department. He was formerly technical representative in Boston. At the same time, *J. C. BARTHEL* was made assistant technical director of the region.

1952 U. S. Paper and Board Production by Division and State

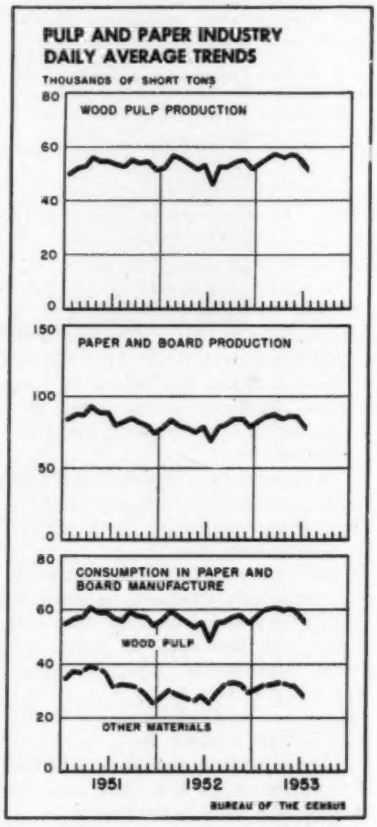
(1,000 tons)

	Total, all grades	Paper	Paper-board	Wet Machine Board	Construction Paper and Board
United States total	24,423	10,898	10,772	139	2,614
Northeast	6,797	4,077	2,081	99	541
New England	2,749	2,020	566	56	87
Maine	1,372	1,331	15	(d)	(d)
New Hampshire	244	201	(d)	13	(d)
Vermont	(d)	63	(d)	...	.....
Massachusetts	679	404	251	(d)	(d)
Rhode Island	(d)	.....	.....	...	(d)
Connecticut	287	22	244	(d)	(d)
Middle Atlantic	4,068	2,057	1,515	43	453
New York	1,736	1,053	544	(d)	(d)
New Jersey	923	147	496	(d)	(d)
Pennsylvania	1,409	856	476	14	63
North Central	6,393	2,734	2,961	(d)	(d)
East North Central	5,502	2,460	2,649	(d)	(d)
Ohio	1,359	549	689	(d)	(d)
Indiana	280	(d)	251	...	(d)
Illinois	761	(d)	504	(d)	211
Michigan	1,463	(d)	882	(d)	(d)
Wisconsin	1,640	1,307	323	...	9
West North Central	891	275	311	...	305
Minnesota	689	275	(d)	...	(d)
Iowa	70	.....	(d)	...	(d)
Missouri	(d)	.....	(d)	...	34
Kansas	(d)	.....	(d)	...	(d)
South	8,750	2,898	4,752	(d)	(d)
South Atlantic	4,910	1,148	3,522	(d)	(d)
Delaware	44	(d)	(d)	...	.....
Maryland	230	(d)	(d)	...	(d)
District of Columbia	.....	.....	.....	...	.....
Virginia	784	(d)	497	(d)	(d)
West Virginia	24	(d)	(d)	...	.....
North Carolina	604	(d)	405	...	(d)
South Carolina	937	(d)	(d)	...	.....
Georgia	1,010	(d)	620	...	(d)
Florida	1,256	(d)	967	...	(d)
East South Central	1,582	733	289	...	560
Tennessee	299	(d)	172	...	(d)
Alabama	636	502	(d)	...	(d)
Mississippi	647	(d)	(d)	...	(d)
West South Central	2,258	1,018	941	...	299
Arkansas	(d)	(d)	.....	...	(d)
Louisiana	1,522	489	793	...	239
Oklahoma	(d)	.....	(d)	...	.....
Texas	391	(d)	(d)	...	(d)
West	2,483	1,189	978	(d)	(d)
Mountain	(d)	(d)	(d)	...	.....
Idaho	(d)	(d)	(d)	...	.....
Colorado	(d)	.....	(d)	...	.....
Pacific	(d)	(d)	(d)	(d)	(d)
Washington	(d)	748	264	...	(d)
Oregon	582	410	(d)	...	(d)
California	759	(d)	535	(d)	197

(d) Withheld to avoid disclosing figures for individual companies. Source: U.S. Department of Commerce.

July Pulp, Paper and Board Production

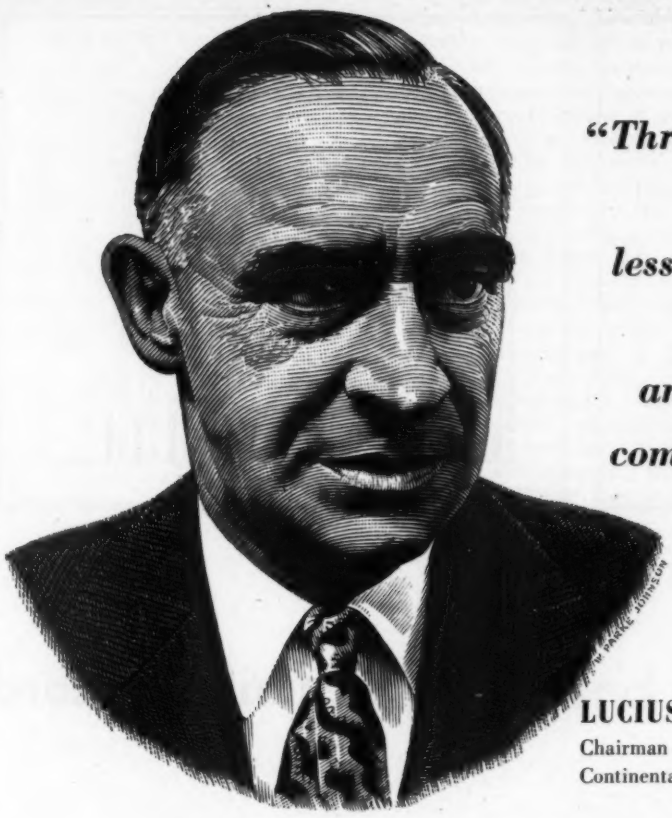
Paper and board production during July amounted to 2,042,196 tons, according to a report recently released by the Bureau of the Census. This is an approximate 16 per cent increase over the tonnage of 1,761,982 produced in July a year ago. The output of paperboard grades during the month, amounting to 929,621 tons, reflected an increase of 20 per cent over the production of July of 1952. Paper production, amounting to 872,285 tons, registered a 14 per cent increase over the 765,733 tons produced in the same month a year ago.



Pulpwood receipts at the pulp mills during July amount to 2,431,825 cords, with consumption at 2,175,903 cords. Month-end inventories increased about 5 per cent to 5,200,679 cords.

Wood pulp production during July amounted to 1,360,332 tons, as compared to 1,192,025 tons produced in July a year ago.

Wood pulp inventories at the end of July at the paper and board mills amounted to 533,569 tons, showing a slight decline during the month. Month-end stocks at the pulp mills were 154,457 tons, about 10 per cent below the 172,295 tons reported at the end of June.



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LUCIUS D. CLAY
Chairman of the Board
Continental Can Company

"The regular purchase of Savings Bonds through the Payroll Savings Plan by millions of our citizens contributes importantly to the country's economic stability, the national defense effort, and to the financial independence of the individual. The thrifty, self-reliant citizen is one far less likely to be taken in by the false promises and ideologies which communist propagandists invariably direct to the 'have nots'."

• To thousands of company executives, accountants, payroll department employees, PSP means Payroll Savings Plan, the simple payroll allotment operation through which employees make a monthly investment in U. S. Savings Bonds.

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• Thanks to the thousands of companies which offer their employees the Payroll Savings Plan, Bill Brown in the Machine Shop . . . Joe Green in the boiler room . . . and eight million more Browns and Greens can well turn a deaf ear to ". . . the false promises and ideologies . . ." of communist propagandists. Bill can see his new home taking shape in his growing stack of Savings Bonds . . . Joe sees each bond another step toward a college education for little Joe . . . and the "Old Timer," who eats his lunch with Bill, talks of "sitting down pretty soon" because his Bonds will make a nice addition to his Social Security.

• PSP holds still another benefit—this one for the employer. Payroll Savers are conscientious workers. Statistics show that absenteeism goes down, production improves and accidents decrease as payroll participation goes up.

• If employee participation in *your* Payroll Savings Plan is less than 50%—or if your company does not have a Payroll Savings Plan—get in touch with Savings Bond Division, U. S. Treasury Department, Washington Building, Washington, D. C. Learn how easy it is to help your country, your employees and your *company*—through the PSP.

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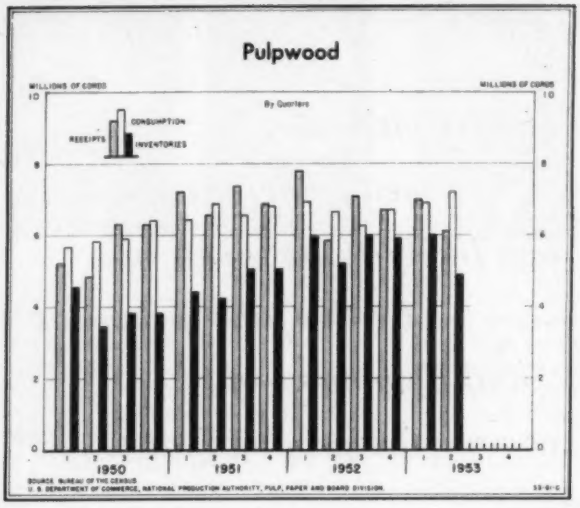
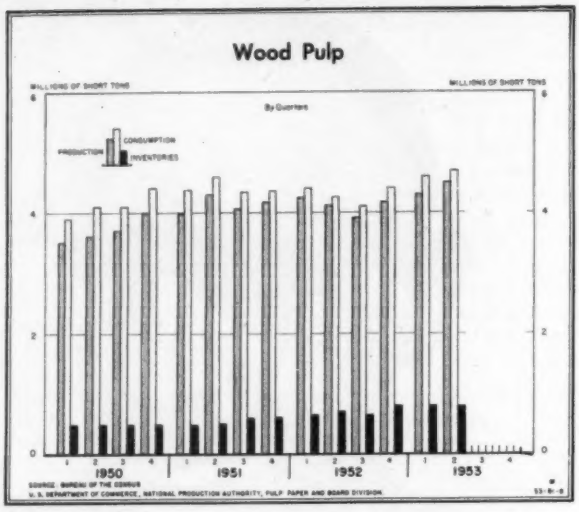




New high annual record

W. LeROY NEUBRECH*

Total paper and board production of all grades in the first six months of 1953 was 9.8 per cent above that of the corresponding period a year ago. While paper production showed no change, paperboard output was higher by 19.5 per cent, wet machine board by 18.8 per cent, and construction paper and board by 13.7 per cent.

PULP, PAPER AND BOARD manufacture, converting, and distribution maintained the general pattern of high level activity characteristic of almost every other important industry during the second quarter of 1953. This was reflected in near all-time peaks in such economic barometers as the gross national product and the Federal Reserve Board index of industrial production.

The third quarter also shows strong indications of maintaining a rate close to the preceding quarter and, taking into account normal seasonal factors, the fourth quarter should likewise be favorable. Barring unforeseen adverse developments, the paper and board industry should establish a new high annual record in production of about 26.5 million tons. Early in the year this report made an estimate of a probable output of 26.3 million tons for 1953.

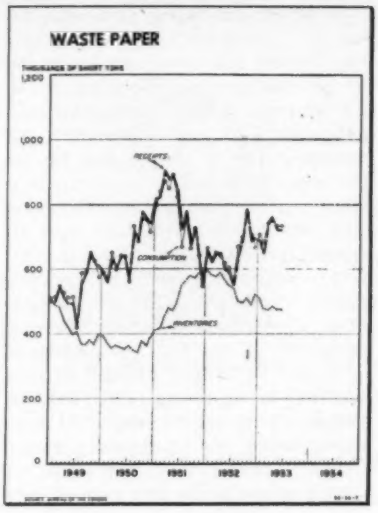
Generally speaking, the situation throughout the industry is sound and healthy. Inventories of paper, board and products in the hands of converters and wholesale merchants are reported in satisfactory grade distribution, though approaching a high volume relative to consumption or sales. Stocks in some distribution channels may be nearing a precarious position.

On the other hand, inventories of pulpwood, waste paper, wood pulp, and other raw materials at the pulp, paper and board mills are considered satisfactory—neither substantially too high nor too low—with evidence that new supplies will continue steadily available at reasonable prices. By employing prudent judgment, management throughout the industry should not encounter such problems as the 1951 shortages coupled with inventory buying, or the surpluses and inventory liquidation that plagued production in 1952.

Industry in general should not lose sight of the recurring fluctuations in production, employment, and prices brought about by inventory cycles. Management of manufacturing plants, as well as of wholesale and retail establishments, should be alert to inventory positions in their particular commodities. The latest statistics disclose that the nation's aggregate inventories at manufacturing, wholesale, and retail levels are at an all-time peak. However, taking into account the larger volume of sales or consumption, the ratio of inventories is approximately consistent with previous practices.

It would seem, nevertheless, that caution should be exercised with respect to stocks in various field of commodities, including paper, board, and products.

*Deputy assistant director for pulp, paper and paperboard, Forest Products Division, National Production Authority.



board manufacture, converting, and distribution, strenuous efforts continue toward improving efficiencies and reducing operating costs. Numerous mills have installed new equipment or rebuilt older machines so as to speed up output and improve quality. Wholesale merchants are modernizing warehouse facilities and methods of handling stock. Whenever possible, overtime is being eliminated in order to keep direct labor costs at a minimum.

New product and quality research is continuing to receive greater attention than in the years gone by. The introduction of latex, resins, and other chemicals is resulting in many new important qualities and applications for paper and paperboard. At least one company is experimenting with the introduction of glass fiber into a kraft

pated for the ensuing several months. National inventories are down nearly 4 per cent below a year ago, with substantial reduction in the Appalachian, Lake, and Northeast regions, where burdensome stocks of old pulpwood had been accumulated during the previous two years.

The renewed interest in pulpwood procurement in larger volume is reported to have strengthened prices on market pulpwood in many areas. A larger winter cut of pulpwood in the northern states and in Canada is expected again this year, following the lull in the 1952-53 season.

Wood pulp

Supplies of wood pulp continued adequate to meet the record-breaking consumption of 9,713,000 tons in the first

in production of paper and board indicated

The mere fact that in many industrial fields present capacity exceeds current high level demand may contribute to some tendency to "oversell" converters or distributors beyond the actual volume of ultimate consumer purchase and consumption, which could lead to distress later on. The relatively recent higher price quotations on some grades of paper and board, as well as products, may lead to further buying for inventory should purchasers anticipate a continuation of this trend.

At all stages of primary paper and

sheet to increase toughness. The use of new types of paperboard containers recently developed for shipping citrus fruits, lettuce, and other farm products is reported expanding rapidly.

Pulpwood

Consumption of pulpwood in the first half of 1953 was at the highest level in history, totalling over 14 million cords and registering an increase of 4.2 and 6.4 per cent, respectively, over the same periods of 1952 and 1951. Supplies continue adequate with no problems anticipated for the ensuing several months. National inventories are down nearly 4 per cent below a year ago, with substantial reduction in the Appalachian, Lake, and Northeast regions, where burdensome stocks of old pulpwood had been accumulated during the previous two years.

The renewed interest in pulpwood procurement in larger volume is reported to have strengthened prices on market pulpwood in many areas. A larger winter cut of pulpwood in the northern states and in Canada is expected again this year, following the lull in the 1952-53 season.

Wood pulp

Supplies of wood pulp continued adequate to meet the record-breaking consumption of 9,713,000 tons in the first six months of 1953. Supplementing the peak domestic half-year output of 8,781,000 tons were imports totaling 1,093,000 tons. Imports were up about 170,000 tons, or nearly 19 per cent, over the first half of 1952. Exports, on the other hand, dropped nearly 80,000 tons, or 55 per cent less than a year ago.

In the first half of 1953, the strong demand for practically all grades of paper and paperboard resulted in the partially integrated and non-integrated paper and board mills operating at a higher level of production than they were able to

Inventory Trends—June 30th Inventory and Ratio to June Sales or Consumption

	1950		1951		1952		1953	
	Units	Ratio	Units	Ratio	Units	Ratio	Units	Ratio
All Industry and Business (Millions of Dollars)	54,191(1)	1.36	72,041	1.64	72,994	1.65	77,193	1.57
Manufacturing	29,603	1.51	39,684	1.76	43,013	1.96	45,233	1.73
Durable	14,555	1.58	19,903	1.85	23,472	2.33	25,610	1.98
Nondurable	15,048	1.45	19,780	1.67	19,547	1.65	19,623	1.49
Wholesale	8,449	1.06	10,648	1.25	9,878	1.16	10,361	1.20
Retail	16,139(1)	1.33	21,709	1.68	20,097	1.44	21,599	1.40
Pulp, Paper and Board Mills(2) (Millions of Dollars)	677	1.25	878	1.23	1,028	1.64	966	1.32
Pulpwood (Thousands of Cords)	3,392	1.71	4,180	1.85	5,149	2.42	4,948	2.09
Wood Pulp (total) (Thousands of Tons)	406	0.30	440	0.29	552	0.40	542	0.35
Market Wood Pulp	326	1.35	348	1.48	404	2.32	396	1.87
Waste Paper	334	0.55	491	0.60	549	0.91	473	0.65
Finished Paper	345	0.44	299	0.33	412	0.57	455	0.53
Non-Paper Pulp Consuming Plants								
Dissolving Market Pulp (Thousands of Tons)	N.A.	N.A.	66	1.20	89	1.59	80	1.23
Wholesale Paper Merchants (Millions of Dollars)	219	1.34	245	1.21	269	1.45	276	1.47
Newspaper Publishers—Newsprint-(Thousands of Tons)	382	1.02	452	1.24	551	1.45	561	1.47

N.A. Not available. (1) Not strictly comparable with data for later years. (2) Total inventories of all raw materials, goods in process, and finished goods. Sources: Prepared by the Forest Products Division, National Production Authority. General industry and wholesale paper merchants data from Office of Business Economics, Dept. of Commerce; data on pulpwood, wood pulp, and waste paper, from Bureau of Census, Dept. of Commerce; finished paper from American Pulp and Paper Association Monthly Statistical Summary; newspaper publishers data on newsprint from American Newspaper Publishers Association.

maintain in 1952. As pointed out in special studies which have appeared in this series of reports,* during periods of weakened demand, when the near-full capacity of the total industry cannot be utilized, the non-integrated segment of the industry normally suffers a greater proportionate decline than the fully integrated mills. This situation is reflected in market wood pulp consumption data. For example, in the receding paper and paperboard market of the first six months of 1952, market wood pulp consumed by pulp-purchasing paper and board mills declined 271,000 tons, or 19 per cent below the 1951 period, while at the same time total wood pulp consumed by all paper and board mills dropped only 228,000 tons, or 2.5 per cent in similar comparison. The strengthened paper and paperboard market during the first half of 1953 resulted in consumption of market pulp increasing 109,000 tons, or 9.4 per cent over the first half of 1952, while total pulp consumed by all mills increased 618,000 tons, or 7.1 per cent in like comparison.

Market wood pulp consumption by paper and board mills amounted to 1,266,000 tons in the first half of 1953, compared with 1,157,000 tons and 1,428,000 tons in the respective periods of 1952 and 1951.

The strengthened 1953 demand for market pulp, both in the United States and in many foreign countries, resulted in some firming in Scandinavian quotations, although trade reports indicating overseas pulp prices to the United States, until recently at least, were still slightly below prevailing North American contract prices. It is believed that international supplies of market wood pulp are sufficient to meet world requirements in the coming months, and that pulp producers, exporters, and consumers again will welcome a more firm and steady market after the rather violent trends in supply and prices from 1950 through 1952.

The more attractive Scandinavian wood pulp prices in 1953 largely accounted for the substantial gain in imports from overseas and the slight decline in receipts from Canada.

The steady growth in integrated wood pulp production and consumption is caused by the fact that practically all new capacity expansion in the past several years has been in completely integrated mills. Even in the year 1952, when total paper and board production dropped to 24.4 million tons against the record output of 26.1 million tons in 1951, total wood pulp consumption for paper and board manufacture declined only 463,000 tons. The largest decline in 1952 fiber consumption, compared with 1951, was in waste paper, which dropped 1,190,000 tons.

A new six-months record was also established in 1953 in the consumption of 362,000 tons of wood pulp by non-paper mills, a gain of 5.7 per cent and 8.7 per cent, respectively, over the previous two years.

Waste paper

Waste paper consumption in the first half of 1953, amounting to 4,348,000 tons, increased 17.3 per cent over the 1952 period, closely following the pattern in paperboard production. Receipts of waste paper were approximately equal to consumption during the first six months, with inventories remaining relatively steady during this period. However, compared to a year ago, June waste paper inventories were down 76,000 tons, or about 14 per cent. It will be recalled that during the first half of 1952 there was an accumulation of waste paper inventories when paperboard production was at a lower level and on a downward trend.

The relationship of waste paper prices to demand is particularly sensitive. In June, 1952, the average index price of waste paper, as reported by the Bureau of Labor Statistics (1947-49=100) was 55.1. By April, 1953, it had advanced to 88.3, and in June it stood at 85.0. Waste paper is one of the few commodities in the B.L.S. price index which is currently below the 1947-49 average of 100. At the same time, it was one of the few items which advanced to such a high peak in the year 1951, when the waste paper sub-group averaged 188.2.

Paper and board

Comparing the first six months of 1953 production of paper and board with the same period of 1952 can be misleading unless the situation of a year ago is understood. With respect to most grades of paper, demand and production were running at a high level in early 1952, since the inventory liquidation cycle in paper did not take place until the second and third quarters of last year. On the other hand, the inventory liquidation cycle in paperboard started in the last half of 1951 and carried through the first half of 1952. During this period paperboard output was at a slackened level.

With this in mind, it will be observed that total paper and board production of all grades in the first six months of 1953 was 9.8 per cent above that of a year ago. Paper production recorded no change, but paperboard output was up 19.5 per cent, wet machine board up 18.8 per cent, and construction paper and board up 13.7 per cent.

Paper items recording gains were tissue (up 15.8 per cent); absorbent papers (up 15.5 per cent); sanitary papers (up 9.1 per cent); uncoated book papers (up 6.3 per cent); coarse papers other than unbleached kraft (up 3.8 per cent), and machine coated printing papers (up 2.8 per cent). Tonnage losses occurred in other paper grades offsetting the gains. The most significant declines were recorded for fine papers (down 8.5 per cent); uncoated groundwood printing papers (down 6.9 per cent). As indicated above, the increases or decreases compared to the first six months of 1952 may be largely ascribed in most instances to the timing of the 1952 inventory cycles and the degree of stock accumulation in particular grades. Actual consumption of most broad use classifications in the first half of 1953 was undoubtedly greater than in the 1952 period.

The most spectacular increases for 1953 compared to the first six month of 1952 are in paperboard, wet-machine board, and construction paper and board, brought about partly, at least, by the lowered level of output in the first part of last year when stocks were being reduced. Actual consumption of these products in 1953 was probably at all-time highs. Among the most prominent gains were construction boards (up 22.9 per cent); non-bending boards (up 22.3 per cent); container board (up 22.2 per cent); wet machine board (up 18.8 per cent), and bending boards (up 16.4 percent).

Wholesale paper merchants reported a very satisfactory level of sales in the first half of 1953, being 3.4 per cent more than in 1952 but 10.5 per cent below the 1951 period. A greater degree of competition is reported to exist among merchants than among producing mills, with the result that the wholesalers, while not encountering much price reduction, are nevertheless finding it difficult to pass on higher mill prices to customers. Profit ratios are stated in many cases to be smaller than a year ago. Customers, for the most part, are placing smaller orders and expecting prompt delivery of good quality. The merchants, in turn, are expecting prompter shipment from the mills in smaller lots. On some grades of printing papers, specifically coated papers, the strong prevailing demand has extended mill delivery schedules considerably in the last few months. Paper merchants' inventories, as of the end of June, were at a slightly higher ratio to sales than a year ago, and were at a substantially higher ratio than in 1951 or 1950. Merchants should carefully anlayze their inventory position relative to their estimated market and supply situation over the next several months.

*See March 1953 and December 1952 reports.

R. W. HAGEMEYER*

New developments in paper coating pigments

Progressive refinement in paper coating pigments in general, and calcium carbonate in particular, has resulted in better uniformity, brightness, smoothness, opacity, ink-receptivity, and color of coated paper

THE PROCESS OF COATING papers with finely divided minerals to improve printability, reproduction and appearance has been used for many years. Improvements in coating machinery, methods, formulations, and raw materials have enabled the paper coating industry to come a long way from the humble and crude beginning, when coating colors were applied by hand to the highly mechanized operations of today. Through the joint efforts of the paper mills, their suppliers, and their customers the quantity and number of grades of coated paper have increased the quality has improved, and the comparative costs have decreased. If this trend continues, and there is every indication that it will, even the prospect of coated newsprint could become a reality.

While much can be said about the improvements in coating machinery, coating formulations, and base stock furnishes, the primary purpose of this article is to discuss the role of the paper coating pigments or, more specifically, calcium carbonate in this general development.

Coating pigments

Clay and calcium carbonate are the commonest coating pigments, although substantial quantities of titanium dioxide, lithopone, satin white, and barium sulfate are also used. China clay, the most widely used pigment, is available in a number of varieties and at various prices. Prior to the second World War, large quantities of coating clay were imported from England, though more recently the trend has been toward the utilization of domestic products. Uniformity and brightness of clays are being constantly improved, while at the same time the variety of forms available is increasing. This development has progressed to the point where wide variations in the properties of a coating color, as well as the coated sheet, can be obtained by merely substituting different clay fractions.

Calcium carbonate is second to clay in the total tonnage used in coating formulations. It is a relatively inexpensive source for high brightness, opacity, ink receptivity, and smoothness. Calcium carbonates, as a group, differ widely from clays; they vary in particle shape as well as size. Also, there is a much broader range of particle sizes available. For this reason, a good deal of care must be used in selecting the proper calcium carbonate since markedly different flow and finishing properties may be obtained, depending on the particular material used. Here again, as in the case of clays, advances by producers are resulting in constantly improved products, while the variety of forms available is likewise increasing.

Titanium dioxide and lithopone are used to increase opacity and brightness. The former gives more opacity in relation to the amount of pigment used than any other white pigment, but its high cost restricts its use. Barium sulfate is used to obtain brightness and opacity, but it, too, is being replaced to a considerable degree by pigments capable of contributing these properties at a lower cost.

Large quantities of satin white were formerly used for the purpose of imparting high gloss, but it has largely been replaced as the result of improvements in other coating materials.

What are the basic requirements of a coated paper if it is to handle well on the press, give true reproduction, and have a smart final appearance? According to present standards, to meet these requirements a coated paper should have good uniformity both in the surface and overall, a high degree of smoothness, controlled ink receptivity, and uniform thickness both in the coating and in the base stock. In addition, it should have high brightness, opacity, and resiliency, balanced moisture content, uniform formation with no tendency for two-sidedness, dimensional stability, good surface strength, and be neutral in color. Of these qualities, uniformity, smoothness, ink receptivity, opacity, brightness, and color can be directly effected by the pigment or pigment-combination used in the coating formulation.

Greater uniformity

A need for uniformity, while always recognized, becomes even more significant in view of the many advances in both the printing and photographic processes. The demand for sharp clear reproduction in both single and multicolor operations, with a minimum of down-time on the press, can only be met by a coated sheet having good uniformity. Since it is primarily the pigment in the coating that comes in contact with the prining surface, the uniformity of the pigment used plays a dominant role in the printing qualities of the final coated sheet.

Early paper coating pigments were as

*Technical assistant manager, Calcium Carbonate Department, Wyandotte Chemicals Corp.

crude as the operation in which they were used. In general, these pigments were naturally occurring materials that were supplied in coarse particle sizes with wide daily variations both in color, size, and purity. Over the years, mechanical developments in grinding and separating equipment have resulted in products of finer and of more discrete particle size. In spite of these improvements, progress in paper coating formulations and equipment soon created a demand for even more uniform pigments than could be produced by mechanical grinding and separating. In the case of calcium carbonate, chemically precipitated products were introduced to fill this demand. These synthetic calcium carbonates have two prime advantages over the naturally occurring whiting. First, by controlling the precipitation process a uniform product can be made having a narrow particle-size range at whatever particle size is desired. Second, since these products are synthetically manufactured, the harmful impurities occurring in naturally mined products can be eliminated. The resultant physical and chemically controlled product lends materially to the uniformity of a paper coating even when used in combination with naturally occurring materials. In some instances, carefully controlled products of this type have been used in combination with less uniform pigments for the prime purpose of smoothing out the variations.

The importance of uniformity cannot be over-emphasized since present trends towards high coating speeds, automatic controls, high solids coatings, greater press speeds and a larger number of impressions leave less room to adjust for a variable raw material. As this trend continues, losses through down-time will be even greater; the importance of uniformity will increase. In many cases savings can be realized by paying a premium for a very uniform calcium carbonate and gaining the advantages of less down-time in the paper coating and printing operation. The need for high brightness is self-evident, while the factors of purity, hiding power, particle size, particle shape, and flow characteristics are interrelated, affecting the opacity, smoothness, ink receptivity, and color of the coated sheet.

Improved smoothness

Use of these improved pigments permits closer quality control, which in turn results in a more uniform final coated sheet. Actually, in some instances these synthetic pigments more than paid for themselves by decreasing down-time both on the paper machine and on the printing press.

The smoother the coated paper the more nearly flat the surface presented to the printing plate and, barring other factors, the better the register obtained. Smoothness of a coated paper can be affected by many things. From the standpoint of the pigments used, the factors of particle size, particle shape, and flow characteristics should be considered. The possibility of obtaining a truly flat surface increases as particle-size decreases, assuming that the pigment particles can be dispersed and there are no adverse side effects (i.e., structure formation, thixotropy, pattern etc.). Some of the early paper coating pigments had particle size ranges of from 20 to 50 microns. Naturally papers coated with these coarse materials were not nearly as smooth as those obtainable today using pigments with a particle size of 2.0 microns and below. With regard to shape, the ideal particle for a paper coating pigment would be a sphere, since such a particle would flow well and always be in optimum orientation. As the structure index of the pigment increases, its smoothing and leveling characteristics decrease. If the paper coating is sufficiently plastic, pigments having a high structure index may be properly oriented in the finishing operations. In other cases, blends of high and low structure materials are used to obtain the desired smoothness and leveling properties: a cubically shaped, fine particle-size calcium carbonate will do a good job in this respect.

Ink receptivity

Pigment factors affecting ink receptivity are far too complex to be discussed here. A coated paper should be sufficiently receptive to print well both in the solid and light areas. while absorbing ink rapidly but not excessively and with a minimum of penetration. The factors of surface smoothness and printing plate pressures have a direct effect on the amount of ink absorbed. In the case of calcium carbonates of the same particle shape, the ink receptivity increases as the particle size decreases. Use of calcium carbonate in combination with clay in the paper coating tends to break up the packing of the clay particle, thereby increasing the porosity of the coating and improving the ink receptivity. Some recent work tends to indicate that for particle sizes below 0.2 of a micron, particularly in the case of calcium carbonate, the ink receptivity again decreases; the reasons for this have not been determined.

Improved brightness

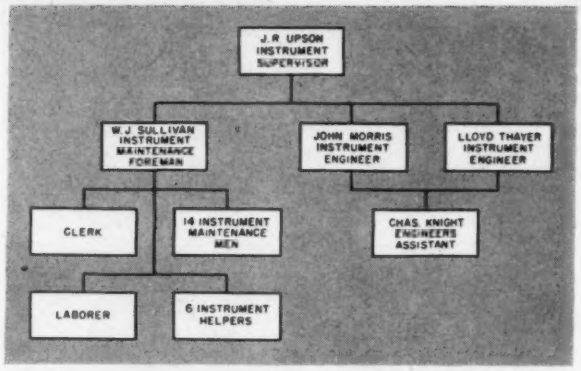
The value of brightness in a coated paper can best be seen in the clarity and sharpness of the reproduction on a bright white sheet. Standard black and white work tends to have more snap in the highlights. In four-color work the resultant clear sharp colors give added life to the reproduction. Naturally, the brightness of the coated paper is largely dependent upon the brightness of the pigments used in the coating formulation. In the case of the naturally occuring whitings, advances in wet washing and processing techniques have resulted in vastly improved products. In the case of precipitated calcium carbonate, improvements in plant procedures and operations have resulted in better and brighter products. For example, there is a chemical precipitation process now in use in which the impurities, commonly present in products manufactured from milk of lime as the raw material, can be eliminated, thus improving the brightness of the final product.

Particle-size and opacity

Good opacity in a coated paper is essential for many reasons—the prime one being to eliminate show-through. The present trend towards lighter base stocks and brighter coatings has been materially aided by the advent of higher hiding and more readily dispersible pigments such as titanium dioxide. At the same time, since hiding power is governed by both the index of refraction and the particle size of the pigment, the opacity of other paper coating pigments has been improved by carefully controlling their particle size. Studies of various pigments seem to indicate that the optimum particle size for maximum opacity is from 0.2 to 0.3 microns (half the wave length of visible light). The results of these tests seem to be borne out in the theory that light reflected from these surfaces would be diametrically out of phase with the incident light and thereby set up maximum destructive interference.

Improved color

The need for neutral color or "white-white" is most pronounced in four-color reproduction. While the common paper coating pigments are generally considered to be white, actually they may give a decided cast to the final coating color. While there are considerable quantities of red and blue toners used for shading coated papers, the desirable effect obtained is far different from that given by an off-white paper coating pigment. The naturally occurring pigments used in the early days of paper coatings varied as widely in color as they did in their other properties. Over the years, better washing, separating, and bleaching techniques have resulted in vastly improved products. Because of the greater possibilities for removing the discoloring impurities, the precipitated products are much better in color than natural whitings.



A well trained and organized instrument department—a must at world's largest integrated kraft container plant

J. R. UPSON*

A MULTITUDE OF INSTRUMENTS and expanding plant facilities, plus round-the-clock plant operation seven days a week—with only four brief maintenance shut-downs per year—place stringent requirements of efficiency, training and organization upon the industrial instrument department of Union Bag & Paper Corp.'s Savannah, Ga., plant. In this largest integrated kraft container plant in the world, the uninterrupted operation of processes is vital. Plans for and the effectiveness of instrumentation for new machines and facilities, as well as replacement of outmoded instrumentation with modern apparatus, all are the responsibility of the instrument department.

Instrumentation in the many and far-flung sections of the plant embraces practically all types and makes. Both mechanical and electronic instruments are widely used. Variables measured by them include practically all of those found throughout industry — among them, level, flow, temperature, speed, pressure, and humidity.

Although from an application standpoint, our instrumentation involves measurement and control problems peculiar to the paper industry, others, such as those in our steam and electric power generating facilities, are identical with those used in many other industries.

This multiplicity of instrument types and control applications and the demand for fast effective instrument maintenance and other factors requires a high degree of proficiency in the personnel. As a result, the organization, training and selection are matters of careful planning and consideration. The entire instrument department is organized so as to provide the highest over-all and individual efficiency in its various functions.

Instrument department—part of technical division

In the manufacture of pulp, paper, paper bags and corrugated containers, very careful control must be maintained over all chemicals and all processing operations. As a whole, this is the duty of the technical division. This division of the company has the responsibility of maintaining chemical controls, improving process equipment and keeping abreast of new developments in the field of science and engineering. Operating as a part of the technical division, the instrument department is charged with the same responsibilities insofar as instrumentation is concerned.

Specifically, the instrument department executes the following functions:

1. Maintains all instruments in an operating condition.
2. Tests instruments on processes to see that they operate correctly.
3. Repairs instruments if they fail in service.
4. Issues new instrument charts and files old ones.
5. Maintains complete instrument parts supply and inventory.
6. Installs new instrumentation.
7. Selects and trains instrument men.

*Instrument supervisor, Union Bag & Paper Corp., Savannah, Ga.

Fig. 1—Exterior of pulp mill, where addition of new stock washers and new digesters is in progress; basic instrument installations are now being completed

Fig. 2—Instrument maintenance man on way to service instrument in the bag plant; motor scooters are employed to enable instrument men to reach destination quickly

Fig. 3—Instrument panelboard for No. 4 evaporator; instruments include steam and liquor temperature recorders, pressure controllers and flow meters to increase operating efficiency

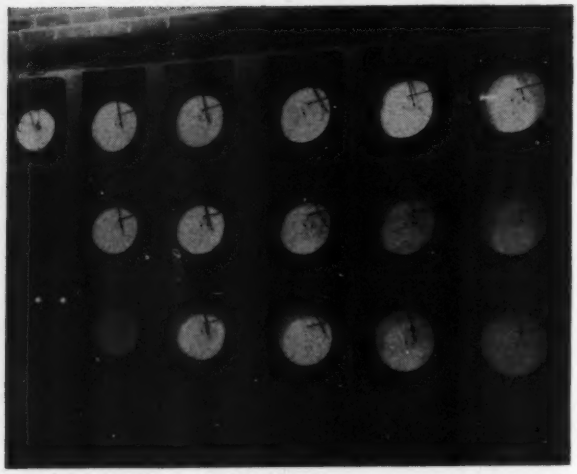


Fig. 4—Instrumentation for pulp washing system at Union Bag & Paper in Savannah includes consistency controls, level controls and recorders for liquor and water flows

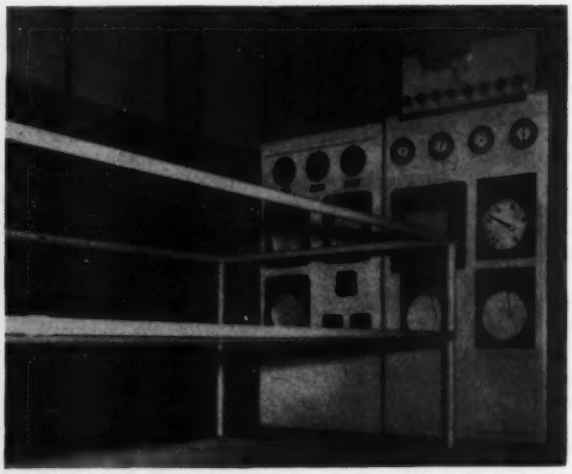


Fig. 5—Instrument panelboard for No. 5 paper machine at Union Bag & Paper incorporates steaming controls, tachometer, recorders for steam flow, oil flow and various pressures

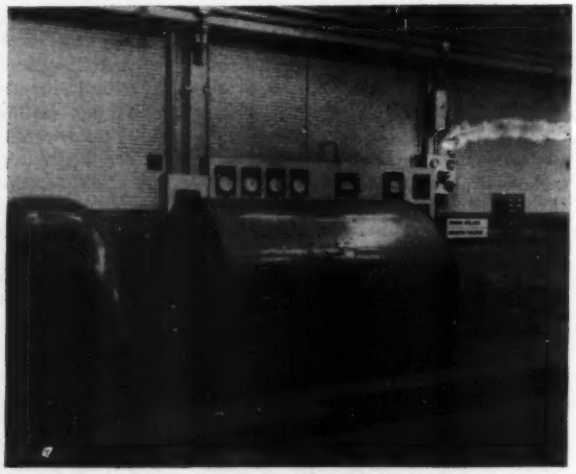


Fig. 6—Portion of instruments in steam reducing station—No. 2 turbine in foreground—main turbine room steam flows and controls, also steam temperatures

Fig. 7—Instrument repair shop; on the left, the engineer's office and drafting room; on the right, an instrument engineer reviews specifications with maintenance man

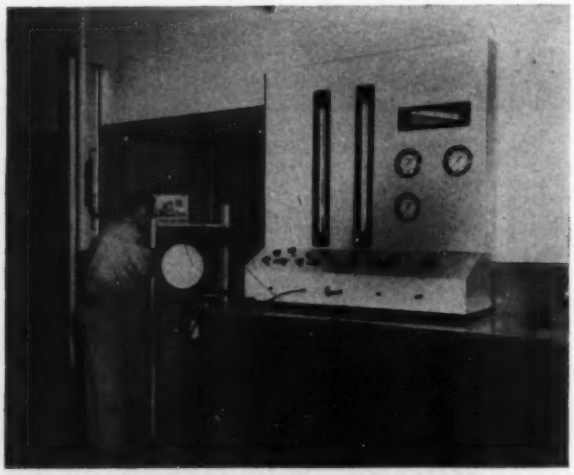


Fig. 8—Maintenance man checking calibration of new flow meter with pressure calibration stand; calibrations from a few inches of water up to 500 psi are checked

8. Keeps instrument obsolescence at a minimum by recommending replacement of older type instruments with newer and more efficient types.

In addition to the above functions, the instrument department executes other vital engineering functions. First, the department is responsible for organizing the report on steam balance throughout the plant. Second, it is expected to work in close cooperation with the engineering department in any plans for new machinery, additions, or facilities. Its function in this respect is to study the measurement and/or control problems involved, and recommend appropriate instrumentation.

Over and above these functions, the department maintains general liaison with the engineering department and with operating personnel. This latter duty is an endeavor to keep production operators aware that instruments are for their benefit and are intended to make their jobs easier. The result is the proper use of instruments and alertness on the part of operators as to their meaning, advantages, and performance.

Instrument department organizations

Organization of the personnel of the department and supervisory responsibility are directed toward obtaining maximum functional efficiency both in routine tasks and special assignments. The accompanying diagram shows the departmental organization, together with the primary responsibilities of each job classification or group.

Referring to the organizational chart diagram, the principal duties of each of the various departmental branches are as follows:

Instrument Engineer—Designs and lays out new instrumentation; studies and solves applicational processing problems; organizes steam balance sheet.

Engineer's Assistant—Performs all drafting work; assists engineers with their projects; maintains engineering files.

Instrument Maintenance Men—Install, maintain, repair and operate instruments.

Instrument Helpers—Change instrument charts throughout plant as needed; spend remaining time assisting instrument men.

Clerk—Label, stamp, and date new charts for instrument helpers; file used charts; maintain parts inventory; post instrument maintenance data.

Laborer—Clean up shop, clean instruments throughout plant.

From an administrative standpoint, the instrument maintenance foreman is responsible for the selection and training of maintenance personnel. He is also responsible for specific assignments for instrument maintenance men and helpers, and participates in group meetings between the engineering department, instrument engineers and the instrument supervisor for purposes of solving processing instrumentation problems. In meetings where the installation of new instrumentation is under discussion the maintenance foreman recommends the optimum operating location for the instruments involved.

Complete parts and repair facilities

Although most repair work is done in the various sectors of the plant proper (due to the continuous operation of the plant, seven days a week), instruments and control equipment requiring major repair and overhaul are brought to the instrument repair shop. In such event, either a reserve instrument (or piece of control equipment) is employed or the equipment is placed on manual control to keep the process in operation. Four shift operators (of a total of 14 instrument maintenance men) are retained on 24-hour schedule to cover possible instrument failure in any part of the plant.

Of the remaining 10 instrument maintenance men, eight are assigned to work in specific areas throughout the plant. One of the other men functions as an electronic specialist and the 14th man acts as an installation specialist. With this arrangement in the matter of assignments, full advantage is taken of the individual capability and experience of each man. The result is fast, effective maintenance or repair action plus all around departmental efficiency both in the servicing and installation of plant instrumentation.

Adjoining the instrument department offices are the repair facilities. These include the general repair shop, meter cleaning room, electronic test rooms, parts storage and chart rooms. Necessary tools and test equipment are provided to repair and calibrate all types of instruments — pressure gauges, recorders, flow meters, tachometers, liquid level meters and potentiometers — used in the production of paper, bags, and boxes.

Calibration equipment includes constant temperature baths for checking all calibrations up to 500°F. Dry baths are used to check thermocouples. Facilities are under way for testing thermocouple calibrations up to 3,000°F. Also included is a pressure calibration stand. Calibrations of flow meters, pressure gauges and other pressure-type instruments with ranges from a few inches of water to 4,000 psi are checked with this equipment.

Instrument parts are card-indexed so that a perpetual inventory is maintained. The inventory and attendant storage facilities are such that many makes or types of instruments can be constructed. For example, in approximately one hour's time, a complete Brown flow meter can be assembled. With this arrangement, practically any instrumentation emergency can be met with a minimum of delay, even though it involves the practical replacement of a complete instrument when those normally used for plant replacement are in service elsewhere.

Training program an important phase

Inevitably, continuing efficiency in instrument maintenance, engineering and installation operations is contingent upon the selection and training of new personnel for this department.

Upon the selection of an apprentice instrument trainee, a well-rounded program of instruction is initiated. This includes both theoretical and practical training. From the theoretical standpoint, the trainee is given instruction in basic electricity and basic pneumatic and hydraulic fundamentals.

On the practical side, the trainee is first taught the instrument chart route. This familiarizes him with instrument locations. Continual day-to-day contact with instruments at various locations and processes, plus instruction from more experienced men ultimately enables the trainee to recognize various process deviations and their causes. The net result of the program is to indoctrinate the trainee simultaneously with instrument theory as well as paper mill instrumentation and routine instrument maintenance.

The trainee is circulated among the 14 instrument maintenance men, and his progress is carefully noted. Upon the appearance of special aptitudes, plans are sometimes laid to eventually develop the trainee into a specialist. In this way, specialists in electronics, pneumatics, installation and so forth are developed within the department. Finally, however, every trainee must qualify as an all-around instrument man. By implementing the training program with the most effective use of individual aptitudes the highest over-all departmental efficiency is continually assured.

Integration of all the instrument department functions as outlined, including dissemination of information to operating personnel, liaison with engineering to assure the most effective instrumentation for new processes and facilities, and the mechanical requirements for peak maintenance, repair and installation facilities, affects plant operating efficiency for all the company's operations. It insures minimum wastage of product plus the practical elimination of unnecessary shut-downs.

Harmac expands production to 210,000 tons bleached kraft

HARMAC FIRST BEGAN its production of unbleached kraft in June 1950. In April, 1951, the first bleached sulfate plant in North America to use chlorine dioxide started operations. Since then, the demand for a pulp with exceptional fiber characteristics and high brightness, plus the general trend toward greater use of bleached sulfate, prompted the directors of MacMillan & Bloedel Ltd. to authorize the expansion of the 250-ton mill at Harmac to a daily capacity of 600 tons of high quality bleached pulp. The extension program began in 1951 and will be complete this month.

Since the inception of Harmac mill, sales have been in the hands of Price & Pierce Ltd., Harmac's exclusive selling agents in the United States and in all world markets.

The design and supervision of construction was placed in charge of H. A. Simons Ltd. of Vancouver, which built the original mill and two other mills on Vancouver Island. This firm's responsibility included purchasing and expediting of materials and equipment, cost control, warehousing, and accounting for the entire job.

The major contractor was Dominion Construction Ltd., which supplied labor and supervision for the construction of foundations and buildings and certain machinery installations. Dominion Bridge Co. Ltd. was responsible for the steel erection of certain tanks, the digesters, and the recovery and new steam boiler buildings. Other contractors included: Vancouver Pipe, Pacific Steel Erectors, Rust Engineering, Combustion Engineering.

Deep-sea wharf

In October, 1952, the new deep-sea wharf, built to berth ocean-going freighters, was completed. Due to the solid rock bottom and strong tidal currents which prevented the use of fill, the wharf had to be built on concrete piers. Sixteen piers were poured, which were finally topped with a steel and concrete deck. This new wharf will allow one deep-sea vessel to berth on the seaward side and smaller coastwise ships or scows on the shoreward side.

Chip handling

Previously reported was the addition of three chip storage silos, bringing the total number of silos to 10, capable of holding approximately 3,750 units of chips.

Also reported earlier was the installation to handle chips brought in to the mill by truck from sawmills on the island not on tide-water. 10-unit trailers are dumped, and the chips are blown up into the silos by a "Conveyair" pneumatic system.

Except for an alteration to the barker log conveyors, the woodroom remains unchanged. With the start-up of the new mill it is expected that a substantial portion of chips will be supplied from whole logs, unsuitable for lumber manufacture, barked and chipped in the woodroom.

The chip screen building has been enlarged so as to allow for the installation of another four Rotex chip screens and surge bins.

The mill added eight new 11½-ft. diameter, 55-ft. high digesters (two Inconel lined A. O. Smith digesters spot-welded by John Inglis Co. and six carbon steel digesters built by Dominion Bridge Co.) to bring the total in the mill to 12. Four of the new digesters, with their heating systems, are housed in a separate building. The main digester building now has eight digesters. All the digesters are of 4700-cu. ft. capacity. The circulation system was supplied by ESCO and is stainless steel throughout. The new digesters are equipped with Yarnall-Waring motor-operated blow valves.

Digesters

Although the digester capacity has been increased 300 per cent, production will only be doubled. This excess in digester capacity will contribute to greater uniformity and higher quality of output.

Also added is a second Dominion Bridge blow tank of 26-ft. diameter by 21½-ft. cylindrical center section, and a bottom cone of 21⅓ ft. Three special heat exchangers (Rosenblad) have been added to the original two heat exchangers of the digester heat recovery system. A second jet condenser to condense the digester blow gases from the new blow tank has been added.

In order to recover the heat from the digester relief gases, a small jet condenser has been added, the condensate going to the existing accumulator tank of the heat recovery system.

Brown stock washing was increased by adding the line of three 11½×16-ft. Sherbrooke brown stock washers, preceded by four Johnson knotters, with a second Gruendler knot crusher and knot

Chip storage silos, shops and material storages

Deep-sea wharf, chip and hog fuel unloading crane

storage tank. Instrumentation was supplied by Minneapolis-Honeywell. Three separate filtrate seal tanks, a foam tank, and two storage tanks were supplied by the Dominion Bridge Co.

The brown stock washers are larger, both in capacity and size, than the washers used in the original mill. The extra capacity in these new washers ensures efficient recovery of black liquor and a well-washed pulp.

The circulation of the filtrate is conventional, with the recovered liquor going to the weak black liquor storage tanks.

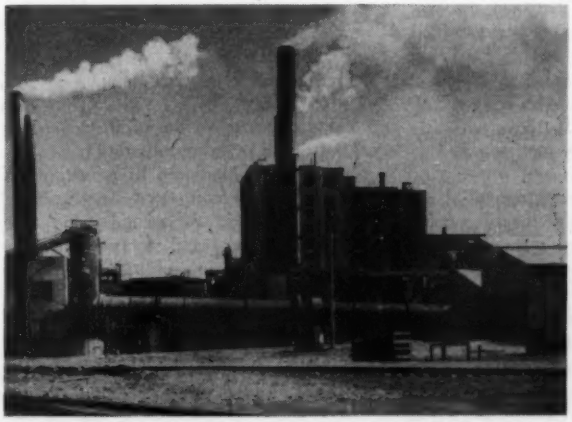
Three Kamyr type "hi-density" towers have been added to take the high-density stock from the washers.

In the enlarged screen room eight lines of Waterous flat screens were added to the existing 12 lines, which formerly screened the brown stock and bleached stock (eight brown stock, four bleached stock). The old installation of 12 lines will now handle the brown stock, which is then thickened by five Sherbrooke deckers. The new set of eight lines will screen the bleached pulp, followed by thickening by four Sherbrooke deckers. Two decker stock chests and white water chests have been added to the original four stock chests and two white water chests. Tile lining of these chests was done by Stebbins Engineering and Mfg. Co.

Bleach plant

A new bleach plant has been built, duplicating the first eight-stage bleach plant. The towers, lined by Stebbins Engineering, have a larger capacity than the towers in the first plant. Sherbrooke Machineries supplied the eight 11½-ft. by 14-ft. washers, three of which are rubber lined. As in the original bleach plant, caustic soda, chlorine, chlorine dioxide and calcium hypochlorite are the bleaching chemicals used.

B. M. Hoffmeister C. Crispin C. W. E. Locke L. G. Harris D. H. Baker J. S. Rogers E. Walloe



Causticizing room, lime kilns, recovery plants

Hog fuel storage, conveyor structures, and recovery building

The bleached stock is discharged into the two "hi-density" storage tanks of Kamyr design.

The bleached pulp is re-screened, as described previously, in order to remove dirt, shives, fiber bundles, etc. The stock then passes over the bleach deckers, thence to the decker stock chests and a second pulp machine blending tank.

All stock and water lines from the unbleached "hi-density" towers to the pulp machine are of wood stave or stainless steel construction, so as to ensure no contamination of the stock. The twin bleaching plants and auxiliaries are thus equipped to produce high brightness chlorine dioxide bleached pulp.

Machine room

The existing machine room was extended, allowing for a second machine and auxiliary equipment to be installed.

The Dominion Engineering fourdrinier section of the new machine uses a wire 178 in. wide and 80 ft. long, has 30 7-in. diameter table rolls, six oscillating suction boxes, Nash automatic wire guide, and Lodding type doctors. The suction couch roll is 36 in. in diameter and is fitted with a double suction box. Three Bingham 125 hp vacuum pumps provide the vacuum for the machine.

A new overhead crane, supplied by Provincial Engineering, extends across both machines and replaces the old crane which serviced No. 1 machine.

The press section of the new machine includes three sets of 36-in. diameter rubber-covered bottom press rolls and 30-in. diameter top rolls. Pneumatic cylinders are provided for top-roll pressure or lifting. The air pressure on the cylinders is recorded and regulated by instruments mounted on panels convenient to the operators. The sheet passes through the first two press sections and then over two 60-in. diameter pre-dryers designed to increase water removal in the third press. Finally, the sheet passes through the third press and into the dryer.

Each press is equipped with a suction box and a shower pipe to clean the felts. All doctors are Lodding type, the top press roll doctors being oscillated.

All rolls in the fourdrinier and press section are balanced for a surface speed of 250 fpm. All felt rolls are rubber-covered, and all bearings are anti-friction.

The sheet passes from the third press over a Toledo Scale automatic basis weight controller and then into a conventional "Flakt" dryer. The horizontal-type dryer, built by Svenska Flaktfabriken in Sweden, is 15 decks high compared to the No. 1 machine dryer of 13 decks. Six fans on either side of the dryer provide the forced air circulation.

Paper Machinery Ltd. supplied the new "Flakt" ventilation system for the entire machine room building, as well as the new "Flakt" heat recovery system for both machines.

The dry sheet leaving the dryer is then passed to a heavy-duty cutter and automatic layboy supplied by Lamb-Grays Harbor Co. The stacked sheets are conveyed to a second 800-ton Baldwin press equipped with an oversize pump, giving high ram speed and long dwell periods.

The new machine is driven by a Harland sectional drive with individually controlled motors for each section of the machine. The motors are interlocked by the Harland system of differential control.

Pulp storage

The existing pulp warehouse was extended, providing a total warehouse storage capacity of 10,000 tons. This building is constructed entirely of wood with the exception of the footings and a concrete loading platform.

Steam, recovery, and causticizing

Additional evaporator capacity was installed using sextuple effect Swenson evaporators. The new evaporators have a design capacity of 600-gpm of weak black liquor (17 per cent solids). These evaporators are of greater capacity than the original sextuple effect installation and have integral catchalls instead of separate centrifugal type catchalls, which are used in the first unit.

The concentrated liquor from the evaporators is further concentrated in a new Murray cascade evaporator, which is larger than the first installation. The new cascade evaporator uses tubes instead of flat plates, which are used in the original evaporator.

The new Combustion Engineering recovery furnace is a spray type with a design pressure of 675 lbs. per sq. in.; it has a heating surface of 37,930 sq. ft. and is designed to handle 1,020,000 lbs. of dry solids per 24 hrs., with a steam capacity of 175,000 lbs. per hour. Larger than the No. 1 recovery furnace, there are certain differences between the two units. The new unit has a water-cooled bottom and has been supplied with a C.E. Elesco superheater. The chemical ash system is continuous, utilizing strong black liquor instead of the circulating weak black liquor, the method used in the first unit.

A Diamond automatic sequential air control system is used together with Diamond long and short retracting types soot blower installation.

Two new 350-lb. air compressors supplied by the John Inglis Co. provide additional air for the soot-blowing system.

The new de-aerating heater is a Cochrane atomizing type. The ID and FD fans were supplied by Sirocco Co., which also supplied the air heater and hydraulic coupling for the turbine-driven ID fan.

The new Combustion Engineering VU hog fuel boiler, which provides additional process steam to the mill, features a spreader-stoker and produces 120,000 lbs. of steam per hour. As in the first two units, steam atomized oil burners have been installed as an alternative means of firing.

Feedwater is conditioned by the Alchem system and is pumped by two Bingham pumps—one turbine-driven and one motor-driven. Boiler controls and instruments are by Bailey.

A second Precipitation Co. electrostatic precipitator has been built adjacent to the first precipitator. The recovery furnace gases from both precipitators pass into the original stack. A second stack has been built to carry off the gases from the three hog fuel boilers.

A second Dorr continuous causticizing system of a larger capacity than the first unit has been installed. This consists of a lime slaker, three causticizers, white liquor and green liquor clarifiers, a two-stage mud washer, dregs washer, lime mud storage tank and lime mud 6-ft. by 6-ft. Oliver filter. An 8-ft. by 250-ft. Traylor lime sludge kiln was also added. Additional liquor clarifying capacity was provided to ensure clean white liquor for the digesters so that top quality clean pulp could be continuously produced independent of the liquor system variables. Augmenting the original oil storage tank, a new 45,000-barrel oil tank has been added.

Electrical system

The 13.8 K.V. primary power distribution system is supplied from two 16,000 K.V.A. transformers which step down the 138 K.V. supply from the B.C. Power Commission hydro-electric plant at Campbell River. A new 138 K.V. transmission line has been built to replace the former 60 K.V. line which supplied the original mill. The average power load has been increased from 770 K.W. to 14-15,000 K.W.

A 1250 K.V.A. G.E. turbo-generator is being installed and will be used as an auxiliary power supply during shutdowns, etc.

Water supply

In order to provide additional water for the mill, a pumping station was installed at the Nanaimo River, augmenting the supply from the well system already installed. A second pipe line (50-in. diameter) and storage tank were constructed to bring additional water to the mill from a distance of six miles.

In order to even out the flow of water in the river a million-dollar project was completed at one of the lakes feeding the river. A storage dam was built to provide a reservoir that would supply water during the low period of run-off.

Increasing trend toward high stacking of materials

High stacking and fork truck stability

HAROLD MILZ*

An analysis of truck stability factors, calculation of overturning moment, and practical pointers for operators are truly indispensable information to allow high-stacking with maximum safety.

THE PRESENT HIGH COST, and in some cases the impossibility, of building new or additional storage facilities has re-emphasized the desirability of stacking materials in storage as high as is practical and safe. It is becoming increasingly important that every commercial warehouse and in-plant storage materials handling engineer "utilize the cube" to the best possible advantage.

This urgency has resulted, upon occasion, in the placing of a premium on the stacking heights of fork trucks without due regard to the hazards and limitations involved. For safety and efficiency every user ought to understand these physical laws governing fork truck stability.

It is general practice to leave the problems of fork truck stability to the manufacturer of the truck. Generally, the conditions of operation are outlined and a truck is designated that will do the job. This is sound practice and works out well—if the original job specifications are complete and are accurately determined and transmitted. Many times overlooked is the fact that lighter loads can cause stability trouble if those loads are longer than anticipated, or if they are odd shapes and their centers of gravity fali too far forward. It is also true that heavier loads may put undue strain upon tires, brakes, wheel bearings and the hydraulic system.

It is, therefore, extremely important for the truck purchaser to understand the factors that affect truck stability; to be familiar with the formulas involved, and to be able to apply them to his everyday materials handling problems.

*Chief engineer, Mercury Mfg. Co., Chicago.

Fork truck stability

A fork truck carries loads ahead of wheels in cantilever fashion. Therefore, the downward force is in front of, not over, the points of support. The fork truck can be considered as a simple lever (Fig. 1) with the center of the front drive wheels acting as a fulcrum point between the load and the counterbalancing action of the truck.

Thus, the trailing moment—the truck weight back of the forward wheels, D, multiplied by its lever arm, C—must always be appreciably greater than the forward moment—the load weight, A, multiplied by the length of its lever arm, B. Or, $C \times D$ must always exceed $A \times B$. If it does not, the truck becomes unstable and tips forward.

The principal factor determining the load that can be transported and tiered is the amount of weight remaining on the trailing wheels when the loaded truck is tilted fully forward at the extreme of its lift capacity.

Both electric and gasoline-powered trucks are subject to this same analysis since they are subject to the same forces and conditions.

It is a simple matter to assure sufficient weight remaining on the trailing wheels either by increasing the truck wheelbase or by increasing the counterweight, or both. However, wheelbase length is increased only at the expense of maneuverability. Aisle widths do not usually permit unlimited wheelbase extension.

The amount of weight that can be carried on the trail axle is likewise limited. It is limited not by axle design, but by both the amount of effort and the number of hand turns that we can expect of an operator in steering a truck—unless power-steering devices are used.

The design of trucks, therefore, is governed not only by capacity and wheelbase, but also by steering effort and stability. It is generally accepted that steering becomes too difficult for good operation when the trail wheel weight exceeds 7500 lb.

In order not to exceed this figure, and yet include sufficient weight to permit full forward tilt at extreme elevation (in other words, to determine the *trail wheel weight required* to provide adequate stability under all normal operating conditions), it is necessary first to calculate the *overturning moment.*

Calculation of overturning moment

An overhanging load on a fork truck creates a forward overturning tendency. The tendency may be calculated by multiplying the load weight by the distance from the fulcrum point, or center of the forward wheels, to the load when elevated and fully tilted forward. Such a product is called the overturning moment and is expressed in units of inch-pounds.

For convenience in calculation, overturning moment is divided into three parts: (1) load, (2) loss and (3) tilt moments. Added together they produce the overturning moment.

Load moment is the product of the load weight and one half of the load length, measured parallel to forks. Load moment is one of the terms commonly used to define the capacity of a fork truck.

Loss moment is the product of the load weight and the distance from the fork face to the drive wheel center measured with the mast in a vertical position. This dimension is a constant for any one truck model.

Tilt moment is the product of the gross weight of the pay load times the maximum fork elevation times the sine of the forward tilt angle. This value is approximate because the height is measured to the fork level rather than to the vertical center of the load. However, it is accurate enough for all practical purposes.

The load, loss, and tilt moments added together produce the total overturning moment. In these calculations, all weights must be in pounds and all dimensions in inches.

With these basic data at hand, let us determine the trail weight necessary on a properly-designed fork truck bearing a nameplate rating of 144,000 in.-lb. handling a 6000 lb., 48 in. long load. The truck is assumed to be a standard model lifting to a height of 115 in. with a forward tilt of 5°. The manufacturer's literature specifies a 54-in. wheelbase, with 18 in. from the fork face, or back end of the load, to the drive wheel center.

As previously stated, the overturning moment (O.M.) is expressed as (see Fig. 2):

O.M. = Load Moment + Loss Moment + Tilt Moment, where

Load Moment = $W \times L/2$

Loss Moment = $W \times D$

Tilt Moment = $W \times \sin \Theta \times E$

W = load weight, lb.

L = load length, in.

D = distance from fork face to drive wheel center, in.

E = maximum fork elevation, in.

Θ = angle of forward tilt, deg.

Calculations are as follows:

Load Moment = $W \times L/2$ = 6000 lb. × 48 in./2 = 144,000 in.-lb.

Loss Moment = $W \times D$ = 6000 lb. × 18 in. = 108,000 in.-lb.

Tilt Moment = $W \times \sin \Theta \times E$ = 6000 lb. × 0.0975 × 115 in. = 60,375 in.-lb.

Therefore, the overturning moment, O.M. = 312,375 in.-lb.

Calculation of required trail weight

The next step is to calculate the amount of weight subtracted from the trail wheels under these conditions. This is done by dividing the overturning moment by the truck wheelbase. The amount of weight subtracted from the trailing wheels is therefore

O.M. = 312,375/54 in. = 5785 lb.

The questions which naturally follow are: Is this weight adequate for safe operation under all normal conditions? If not, how much additional weight is required?

Up to this point we have been concerned with static stability only. However, actual use of the truck involves movement, and this requires consideration of additional dynamic forces. This movement may include bringing the truck to a quick stop when carrying the load at slightly elevated position, or cautious maneuvering as required in the tiering operations. It does not allow for traveling at full speed with the load elevated—a practice prohibited by all safety programs. These additional dynamic forces require additional weight on the trail wheel.

Dynamic forces are more difficult to determine than simple overturning moments. They require a knowledge of the exact location of the combined center of gravity of truck and load as well as the exact rate of deceleration.

However, when stacking is done up to 12 ft.—which covers by far the largest percentage of all trucks in use today—a simple empirical formula, which works out well in practice, has been developed to take care of these forces. In those rare cases where higher lifts are involved, additional consideration must be given to the serious problems of stability that are created. When elevating up to 12 ft., the additional trail weight required to offset these forces equals one-tenth of the load weight plus 600 lb. This 600 lb. is a constant regardless of load weight. Because this example which we have discussed uses a 600-lb. load weight, we will require 1/10 of 6000 lb. plus 600 lb. or 1200 lb. Adding this figure to our previously-determined figure of 5785 lb., we arrive at a final required trail weight of 6985 lb.

We can now refer to the manufacturer's literature or make inquiry to determine whether the truck contemplated meets the performance requirements. In the example given, the required trail weight falls well within the 7500 lb. limit, mentioned earlier as required for easy steering.

How to use these data

An understanding of the factors involved in truck stability on the part of the purchaser will serve a dual purpose. First, it will cause him to check for maximum loads and tiering height so that he can provide accurate information to the truck manufacturer in order to obtain the proper truck for the job.

Secondly, it will enable him to check and compare specifications of competitive trucks so as to be sure not to decide in favor of a somewhat lower cost at the sacrifice of adequate stability.

An analysis of truck stability factors also makes clear the fact that static stabiliy remains constant regardless of how high the load is lifted when the truck is on a level floor and the mast is in a vertical position. Not one inch-pound is added to the overturning moment, nor is one pound subtracted from the trail weight, when loads are lifted straight up. The very slight forward shift in load center due to mast deflection and clearance in the mating mast parts is readily compensated for by tilting the mast.

However, there are certain conditions that throw the mast out of its true vertical position: for example, (1) depression or grade in floor surface, (2) deflection of rear springs, and (3) any "whipping" of the uprights or shifting of the bearings while under load. Obviously these factors, if involved, must also be taken into consideration when computing fork truck stability..

Practical pointers for operators

When you have a heavy load high in the air, think of yourself as a professional juggler. If you could sense the balance of your load just as skillfully as he does, you could probably go three times higher in your stacking than anybody else. Now how can these principles be applied?

First, never tilt the mast forward when carrying a load in the elevated position. The point of support must be kept under the load for stability.

Second, never tilt the mast backward beyond the maximum angle of tilt. Doing this allows the center of gravity to go too far toward the rear, and you lose side stability.

The right compromise is to tilt backward the distance of a foot or so, or at least far enough backwards so that the deflection of tires, springs, uprights, and other parts of the machine will not allow the back edge of the load to be farther forward than the front face of the drive tires. The juggler's idea is still in force here. You have to keep the load over the point of principal support, the front wheels.

Avoid making a steering turn with the load in the full elevated position. If you don't the truck is liable to turn over sideways. If possible, make your turns in the aisle with the load at intermediate height.

Last, don't accelerate too fast or slam on the brakes too quick when the load is high. Either operation may cause the truck to overturn. Whenever possible, avoid carrying loads at elevated heights.

Executive compensation plans

J. A. KELLER
Vice President
George Fry & Associates

WITH INCREASING DEMAND in the paper industry for effective utilization of men and material, attractive and well-conceived management compensation policies are essential in insuring dynamic business leadership by attracting and keeping executives of the best qualifications. Sound wage administration practices for shop and clerical workers have gained wide acceptance, yet the payment of firms' important management team has often received insufficient attention. The continuing search for executive talent highlights the fact that an equitable wage structure is needed both to attract and to hold good men at the higher levels.

From president to foreman, management men, like other employees, compare their salaries to those offered both within and without the company as one indication of their employment progress. Above and beyond this comparison, men also seek direct financial recognition for superior performance. Compensation policies geared to gaining maximum performance by management personnel should provide:

1. A satisfactory salary level in comparison with other companies and industries.

2. An equitable salary structure with reasonable pay differentials for positions of various skill and responsibility.

3. An incentive to stimulate management to exert extra efforts to expand sales and profits.

Direct incentive program

Stock purchase plans and other devices for deferred executive compensation have recently grown in importance because of existing tax laws; however, direct incentive programs for management personnel also answer a great need for many firms in the paper industry. By the adoption of an equitable incentive plan, both the company and management men covered by the plan will be in a position to benefit in proportion to results achieved.

A successful management incentive plan should meet the following basic requirements:

1. Provide large enough rewards to stimulate interest.

2. Provide a fair reward to management which is still consistent with the interests of stockholders.

3. Be closely related to the performance of the individual or group concerned.

4. Offer a reward for plus performance and not a substitute for sound base pay.

5. Not sacrifice long-term considerations for short-term advantages.

6. Be easy to understand and to administer.

7. Maintain the position of the company ownership and management in direction, supervision, and control.

Minimum profit expectations of the firm should provide for reasonable dividend payments, maintenance of a sound working capital position, the normal growth of the firm, and the replacement of fixed assets at realistic replacement costs. Considering these requirements and taking into account past experience, present conditions, and future expectations, a basis should be established for determining reasonable performance objectives and for making bonus payments as a reward for outstanding profit results.

It is desirable to place a ceiling on bonus payments to individuals. This ceiling should be at a level which will provide an ample stimulant for extra effort and which will at the same time limit participation in abnormal or unusual profit results over which the individual has little control. Such a ceiling is customarily stated in terms of a maximum percentage of an individual's base salary.

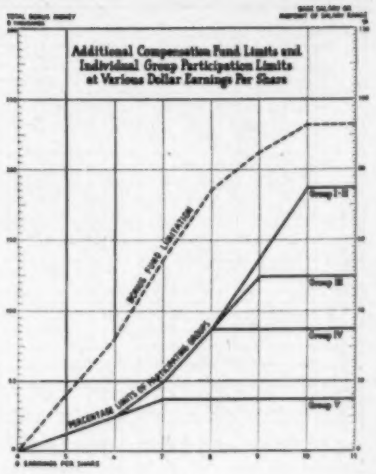
Variations considered

The specific details of an incentive program of management compensation are less subject to standardization than other wage administration techniques. This results from the wide variations found in different companies' sales, financial, and manufacturing organization and goals. Basically, however, any plan utilizes one or both of the following types of plans.

1. Group plans providing bonuses based on the end profits of the company distributed on the basis of fixed percentages for individual jobs.

2. Plans providing individual bonuses as rewards for reaching and surpassing expected levels of performance established in goals or budgets.

While individual incentives are usually more effective, many firms utilize group plans because of easier administration and the difficulty to isolate individual performance factors in management "team" activity. Where it is practical, much is to be gained by setting up individual goals and/or budgets, since both the employee and the company management can better analyze the strengths and weaknesses in each person's performance. Individual incentives are more common in departmentalized


Additional Compensation Fund Limits and Individual Group Participation Limits at Various Dollar Earnings Per Share
Group I-II
Group III
Group IV
Group V

companies where figures on departmental profits, sales, service, expense ratios and other variables can be isolated. Firms with considerable centralization or many staff positions tend to prefer group plans.

One of the most desirable types of compensation plans provides a group bonus plan for executives who exert overall control and policy-making responsibilities and for high level staff positions such as the industrial relations or research managers. Supplementing the group plan, an individual incentive plan for employees responsible for a division, department, or group in operating or sales organizations is very effective.

As individual departments improve, higher goals should be set, while the higher level of department performance should be recognized and rewarded through merit salary raises within the established salary ranges. In establishing goals, an evaluation must be made of the important elements on which the company's success depends in order to set up factors which will promote the overall well-being of the firm.

Managers and department heads should receive monthly operating statements to enable them to compare actual and expected results. This must be followed up with constructive leadership and supervision on the part of top management in improving performance. Continuous emphasis on promoting the incentive plan with adequate and continued management training and development can show remarkable advances in both the performance and the satisfaction of management personnel.

Wage administration, proper incentives, and wide-awake management are subjects of vast importance to every company in the paper industry. Only careful and continuous administration of sound techniques and procedures will provide that dynamic management which is necessary in an increasingly competitive era.

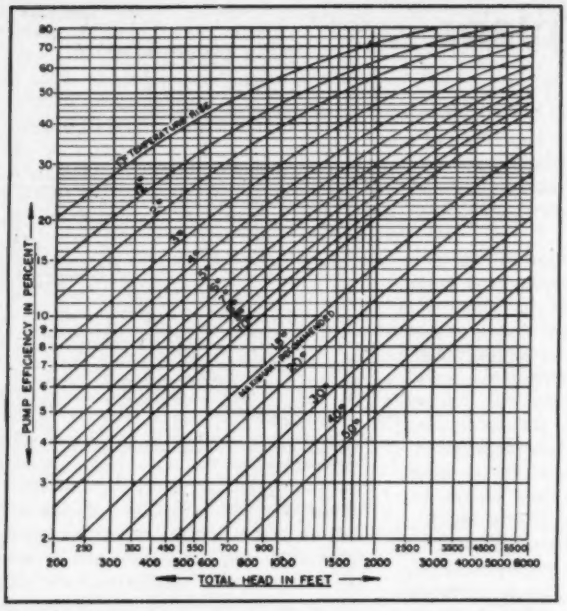


Fig. 1—Chart for determining temperature rise in centrifugal pumps when operating under a given total head and efficiency on the performance curves of the pumps

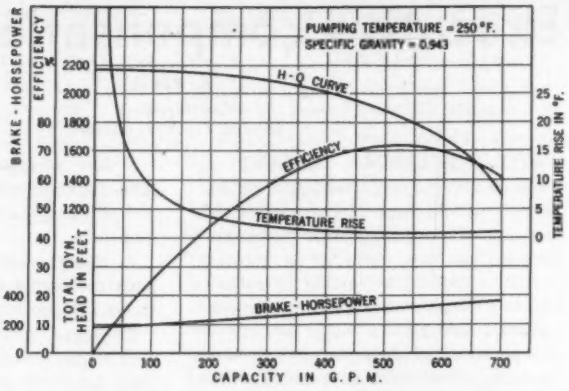


Fig. 2—Performance characteristics of a 500 gpm, 1800-ft. head, boiler feed pump.

Centrifugal Pumps

Part 27 of a series

IGOR J. KARASSIK and ROY CARTER
Application Engineers, Worthington Corp.

Operation of centrifugal pumps

IN THE OPERATION of a centrifugal pump, the difference between the brake-horsepower consumed and the water-horsepower developed represents the power losses within the pump itself. All this power loss is converted into heat and transferred to the liquid passing through the pump. When operating at shut-off, the power losses are equivalent to the shut-off brake-horsepower, and since no flow takes place through the pump, all that power goes into heating the small quantity of liquid in the pump proper.

Protection of centrifugal pumps against overheating

As this process occurs, the pump casing itself heats up, and a certain amount of heat is dissipated by radiation and convection to the surrounding atmosphere. If the amount of heat added to the liquid is relatively small for the physical size of the pump, it can be transmitted through the casing with a low differential in temperature between the liquid in the casing and the surrounding atmosphere. On the other hand, if the power loss is relatively very high, the liquid temperature might have to reach an exceedingly high value, far in excess of the boiling temperature at suction pressure, before the amount of dissipated heat equals that generated in the pump proper.

Very obviously, the rate of heating of the liquid in the pump casing for a given power loss depends both up the volume of the liquid contained in the casing and upon the surface of casing available for heat dissipation. If the total amount of power losses is equivalent to 100 BTU's per sec., and if the pump contains 100 lbs. of water, the water temperature will increase at the rate of 1°F. per second. If, on the other hand, the pump in question is a low head, high capacity unit and contains 5,000 lbs. of water, the rate of temperature increase will be only 0.02°F. per second. These rates would be progressively decreased with increasing temperature, because of an increasing radiation and convection rate. At the same time, it is obvious that when the volume content is relatively small, as in the case of high-pressure pumps, overheating is very rapid, while a large capacity, low head pump with the same total power losses may operate against shut-off for hours without harmful effects.

Assuming that the pump in question is handling water and no heat is dissipated by radiation, the temperature rise can be determined by multiplying the difference between the brake horsepower and the water horsepower by 2545 (BTU equivalent of 1 hp-hr) and dividing this product, the total heat imparted to the water, by the corresponding flow in pounds per hour. A more easily calcuable relation is the following:

$$°F \text{ rise} = H/778\ (1/e - 1)$$

Where: H=total head in feet at capacity in question, and e=the pump efficiency at this capacity. The chart reproduced in Fig. 1 offers a graphical representation of this formula and permits, in addition, the determination of the minimum permissible capacity, once the maximum permissible temperature rise has been selected.

When liquids other than water are handled by the pump, it becomes necessary to correct the resulting answer for the difference in the specific heat of the liquids.

The chart can be used to plot a temperature rise curve directly on the performance curve of a centrifugal pump, as shown in Fig. 2, which represents the characteristics of a boiler feed pump designed to handle 550 gpm of 250°F. feedwater against a total head of 1800 ft. It will be seen that the temperature rise increases very rapidly with a reduction in flow. This is due to the fact that the losses at low deliveries are greater while the total flow, which must absorb the developed heat, is low. Thus, it will be seen from Fig. 2 that for a capaicty of 50 gpm, the temperature rise is 18°F., while, at the full capacity of 550 gpm, it is less than 1°F.

Material from this article will be included in a book on centrifugal pumps now being prepared by the authors; hence, all rights to republication are reserved by the authors.

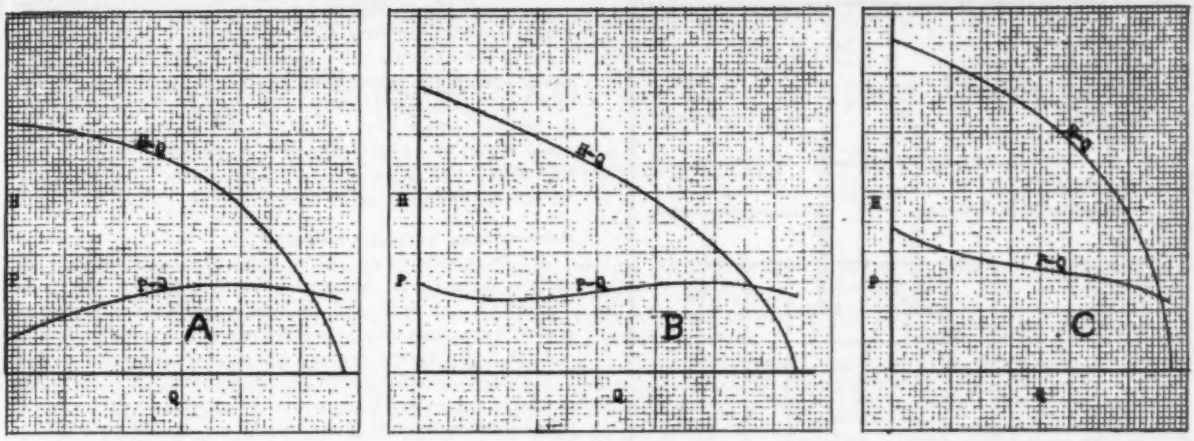


Fig. 3—Power characteristics of a pump influence the starting procedure; A—a pump with a power curve of this type load on the driver during the starting period if started against a closed gate valve; B—if the pump has a power curve of this type there is no preference between starting against a closed gate valve or against a check valve; C—if the pump has a power curve of this type, it should be started against a check valve with gate valve, if any, open.

If the pump is of a type which is fitted with a balancing device, such as a balancing disc or drum, a certain portion of the suction capacity is returned to the pump suction or to the suction supply vessel. The discharge capacity of the pump does not, in such a case, represent the true flow taking place through the pump. The formula and the chart on Fig. 1 can still be used, however, provided that a corrected value is used for the efficiency. This correction automatically takes care of the discrepancy between the apparent capacity (discharge capacity) and the true flow.

Corrected Efficiency = Pump Efficiency $(Q+Qd/Q)$

where Q = Capacity at pump discharge, and Qd = Capacity of balancing disc leak-off

Inasmuch as the temperature rise within a pump varies with the pump capacity, the minimum permissible capacity will actually depend on the maximum permissible temperature rise. The latter varies over a wide range depending upon the type of installation. In the case of boiler feed pumps, it is generally recommended to limit the temperature rise to about 15°F. When the centrifugal pump handles cold water, the temperature rise may be permitted to go higher, up to 50 or even 100°F. The minimum permissible capacity, then is that capacity at which the temperature rise corresponds to the maximum permitted.

There is a convenient rule-of-thumb for determining the minimum capacity of a boiler feed pump and, thus, the necessary by-pass. In order to limit the temperature rise in a boiler feed pump to 15°F., the pump capacity should not be allowed to fall below 30 gallons per minute for each 100 bhp at shut-off.

If its installation may require a pump to operate at shut-off or at extremely low flows, some specific means must be provided to maintain the minimum permissible flow regardless of whether the discharge valve or the check valve is closed. This is achieved by installing a by-pass in the discharge line from the pump, located on the pump side of the check and discharge valves and leading to some lower pressure point in the installation where the excess heat absorbed through operation at light flows may be dissipated. Under no circumstances, however, should this by-pass be led directly back to the pump suction, as there is no means to dissipate the excess heat, and the entire purpose of the by-pass arrangement is defeated.

General precautions before initial starting

(1) Cleanliness is essential. Before putting pump in service, bearing covers should be removed, the bearings flushed with kerosene and thoroughly cleaned. Do not use waste to clean bearings. Rags are better as they do not leave lint. Keep oil or grease free from water, grit, or other contamination. Fill the bearings with new lubricant in accordance with the manufacturer's instructions.

(2) The driver should be tested for correct direction of rotation with the coupling bolts removed from the coupling. There is generally an arrow on the pump casing to show the correct rotation.

(3) A final inspection of all parts should be carefully made before starting. It must be possible to revolve the pump rotor by hand. In the case of a pump handling hot liquids, the rotor must be free with pump cold or heated. If the rotor is bound, the pump must not be operated until the cause of the trouble is ascertained and corrected.

Starting and stopping procedure

The power consumption curve of low and medium specific speed type of pump rises from the shut-off condition (no delivery) to the normal operating condition (Fig. 3-A). For this reason, such pumps should be started against a shut discharge valve in order to reduce the starting load on the driver. Of course, precautionary measures against overheating the pump may have to be employed in certain cases, like boiler feed pump installations, by installing a by-pass.

The power consumption curve of high specific speed type of pumps of the mixed flow and propeller type has generally the opposite characteristic, rising sharply with a reduction in capacity, as shown on Fig. 3-C. Such pumps should, therefore, be started with the discharge valve wide open.

In many cases, stand-by pumps are held ready for immediate starting. This is particularly true of centrifugal boiler feed pumps. The suction and discharge gate valves are held open, the discharge check valve preventing reverse flow through the pump. In order to maintain an idle boiler feed pump at approximately operating temperature, a constant flow of water is permitted to take place through the pump from the open suction through the warm-up valve on the pump side of the discharge check valve. The drains from the warm-up valves are returned to the cycle at some lower pressure point than the pump suction. While, in the event of an emergency, a cold boiler feed pump may be placed in operation without warming up, it is recommended that it be heated in the manner described for approximately 30 minutes before starting.

The steps necessary in the starting of a centrifugal pump depend upon its type and service. Many installations require steps which are unnecessary in other installations. Assuming that the pump in question is motor driven, that its shut-off horsepower does not exceed the safe motor horsepower and

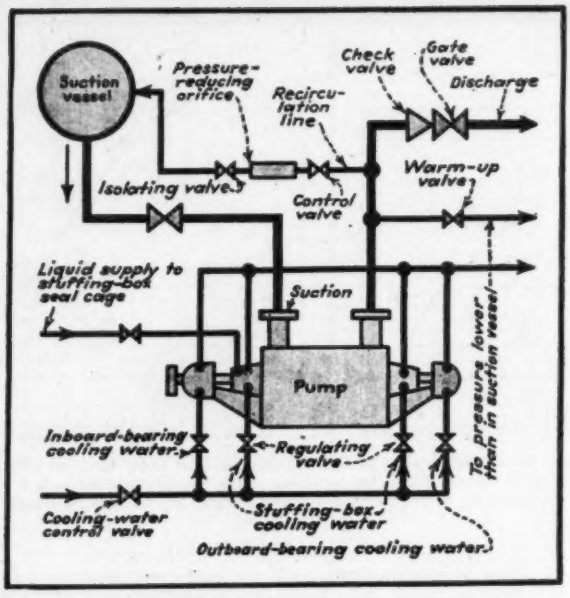


Fig. 4—Schematic diagram shows an imaginary centrifugal pump provided with all the possible in-and-out auxiliary connections that may occur in any installation.

that it is to be started against a closed gate valve, the procedure would be the following:

1. Prime the pump, opening suction gate valve, closing drains, etc., to prepare pump for operation.
2. Open valve in cooling water supply for bearings.
3. Open valve in cooling water supply for water cooled stuffing boxes.
4. Open valve in sealing liquid supply.
5. Open warm-up valve of a pump handling hot liquids, if not kept at temperature and when warmed up, close valve.
6. Open valve in the recirculating line.
7. Start motor.
8. Open discharge gate slowly.
9. Observe leakage from stuffing boxes and adjust sealing liquid valve for proper flow to insure lubrication of packing.
10. Generally check mechanical operation of pump and motor.
11. Close valve in recirculating line if there is sufficient flow through pump to prevent overheating.

If the unit is to be started against a check valve with the discharge gate valve open, the steps would be the same except that the discharge gate valve would be opened some time before the motor is started.

Just as in starting a pump, the stopping procedure depends upon the type and service of the pump. Generally, the steps followed to stop a pump which is stopped against a closed gate valve would be:

1. Open valve in recirculating line.
2. Close gate valve.
3. Stop motor.
4. Open warm-up valve if pump is to be kept warm.
5. Close valves in sealing liquid supply and in cooling water supply to bearings and water cooled stuffing boxes.
6. Close suction valve, open drain valves, etc., as required by particular installation or if pump is to be opened.

In case the pump is of a type which does not permit operation against a closed gate valve, steps 2 and 3 are reversed. Many installations are such that they permit the stopping of the motor before closing the discharge gate valve.

In some cases, the requirements of a particular installation will make additional starting and stopping steps or a change in the sequence of the steps necessary.

In general, the starting and stopping of steam turbine driven pumps reqiures the same steps and sequence as necessary for a motor driven pump. As a rule, steam turbines have various drains and seals which must be opened and closed before and after operation. Likewise, most turbines require warming up before starting. The operator should, therefore, conscientiously follow the steps outlined by the turbine manufacturer in starting and stopping the turbine. This also holds for internal combustion engine drivers.

General rules on pump operation

(1) Running a pump dry. A centrifugal pump would have to have excessive clearance between the stationary and rotating parts to run dry for an indefinite period. Most centrifugal pumps have closer clearance leakage joints and cannot be run dry for longer than a few seconds without being damaged.

For one successful design of automatic priming, the pump is started dry at the same time as the vacuum pump is started. The centrifugal pump is required to run dry for a period not over two minutes, and to insure successful operation under this condition the clearance between the wearing rings is made slightly larger than regularly employed.

(2) Throttling pump suction. Throttling the suction of a centrifugal pump causes a reduction of the absolute pressure at the inlet to the impeller. This could be made to result in a reduction of capacity by forcing the pump to operate "in the break." Such operation is harmful to the pump unless—like a condensate pump—it is specifically designed for it.

In some special instances, throttling at the suction may be permissible, when the suction pressure exceeds the minimum requirements by a very comfortable margin—such as in the case of the second pump of a series unit. In such an application, however, the effect is not to reduce capacity by operation in the break, but rather by the reduction of the total head generated by the series unit. This causes the head capacity characteristics and the system head curve to intersect at a lower rate of flow.

Generally speaking, however, throttling at the suction is harmful and should not be employed.

(3) Operation of centrifugal and reciprocating pumps in parallel. In general, this is not good practice. While in many cases a centrifugal pump could be operated in parallel with a reciprocating pump, the general performance of the centrifugal pump both mechanically and hydraulically will be affected by the pulsations of the reciprocating pump. A triplex pump would have the least effect on the operation of the centrifugal, while actual troubles might be experienced with a single acting single cylinder pump.

It is important not to use a common suction line for a centrifugal and a plunger pump, especially if there is a high suction lift.

(4) Restarting motor driven pumps stopped due to power failure. The type of motor control determines if a motor driven pump which has stopped due to power failure will start automatically when the power is restored. Starters are made with low voltage protection, with low voltage release, and without either. Those with low voltage protection "kick-out" with low voltage or power failure, and the units they control have to be started again manually. Starters with low voltage protection can only be used with momentary contact pilot devices and cannot be used with maintained contact pilot devices, such as float switches, unless an auxiliary relay is incorporated in the control.

Thus, except for those installations in which the starters have low voltage protection, resumption of power will cause the unit to start again automatically.

As pumps operating on a suction lift may lose their prime during the period that power is off, starters with low voltage protection are desired for such installations unless the pumps are automatically primed or unless some protection device is incorporated so the pump cannot be run unless primed.

The hand of the worker in the paper industry

W. SCHWEISHEIMER

IN EVERY OCCUPATION hands are the most important tools. They are irreplaceable. They must be in good and efficient condition in order to guarantee efficiency to the man operating machines and mechanical instruments. The changes which the hands of the worker in the paper industry suffer under the influence of mechanical, chemical, thermal (heat and cold) irritations are numerous.

Calluses

Calluses or callosities are circumscribed patches of hard thick skin. They develop as a result of constant pressure and friction over a small or large area of the hand by a tool or any hard object such as workers in this industry are bound to use.

Actually, the callus is a form of protection provided by the body against harmful pressure. Permanent pressure would injure important parts in the deeper layers of the hand. The developing callus represents a protective dam that diminishes the strength of the pressure.

Dermatitis of fingers

In the sulphate process ulcers and dermatitis (inflammation of the skin) are likely to occur on the fingers as a result of splashes of "black liquor." In both the sulphate and the bisulphite processes splashes of the alkaline pulp from the grinders, beaters and hollanders and from the bleaching solutions may cause dermatitis of the hands.

Drs. Schwartz and Tulipan state that the dust and fumes of caustic soda, lye, quicklime, and other alkalis are likely to produce lesions of the skin on the hands and the nails, especially if the substances are hot or the skin has perspired.

Infections of the hand

Wounds of the fingers due to work with sharp and cutting tools are many. Such small injuries may become infected. As Sumner L. Koch states the problem, "The trivial hand injury, promptly and accurately cared for, goes on to rapid recovery; neglected, it may result in serious infection." Injuries of the hand are common, but serious infections are rare under proper medical care.

Good first aid treatment consists in immediate application of an iodine solution or other disinfectant and application of a sterile dressing. Best treatment of injuries is prevention of any further harm. In more severe infections of the hand the use of the modern chemical and antibiotic sulfa compounds and of penicillin is a remarkable progress in the treatment of wounds and injuries.

Infection of the hand may develop to a painful furuncle or boil. In some days or a week it is "ripe," ruptures, and the yellowish-white content is extruded or may be removed mechanically. The general condition of the worker may predispose to an infection; uncleanliness and unhygienic working conditions surely have influence.

Excessive perspiration

Excessive perspiration of the hands is an unpleasant handicap for workers in the paper industry. Moist hands soil everything they touch. There are many sweat glands in the skin of the hands, particularly in the palms. Sweat evaporates, drawing heat from the skin, so the hands feel cold and wet. Cause of the trouble may be some form of anemia or a general condition or a local condition of the skin.

There is also a nervous factor involved. The knowledge that one's hands are cold and clammy may in turn add to the embarrassment. The fear alone of shaking hands with other people may produce increased perspiration. Any emotional upset tends to increase the sweat secretion.

Soaking the hands in hot water for a short time gives relief, also alternating warm and cold hand baths. Recommended are astringent lotions and powders. A dusting powder which contains salicylic or benzoic acid may be applied to the hands.

Trembling hands

Trembling of the hands—tremor—is a most unpleasant condition. The working ability of the worker in the paper industry is sometimes seriously impaired by it. Still, it is astounding to see older men with stiff fingers and arthritis, bent joints and trembling hands carry out exact work with reliability. This indeed is a victory of will over matter.

Sometimes temporary exhaustion after long working hours may be causing the trouble. A few days' rest or even a good night's sleep will restore normal conditions. Anemia, convalescence after serious illness, heart conditions, etc., may be the cause. With improvement of the condition, the trembling of the hands will disappear as well. Changes in the central nervous system may result in trembling hands; they cannot always be cured.

Too much nicotine, too much alcohol or emotional upset may well cause trembling hands, and the tremor may not disappear before the habit has been discontinued for a long period. A chain smoker may have to stop smoking completely because of his trembling hands. A medical checkup is indicated when trembling of the hands is a persisting symptom.

Allergic hands

If a worker in the paper industry is over-sensitive, allergic to certain substances with which he works, he may develop an unpleasant eczema. Such skin inflammation affects the hands or fingers or forearms. While pain is rare, itching is common, particularly when the hands are exposed to heat. The itching sensations may be strong enough to prevent sleep. In the chronic form the skin of the hand becomes thickened, with scaly or weeping patches.

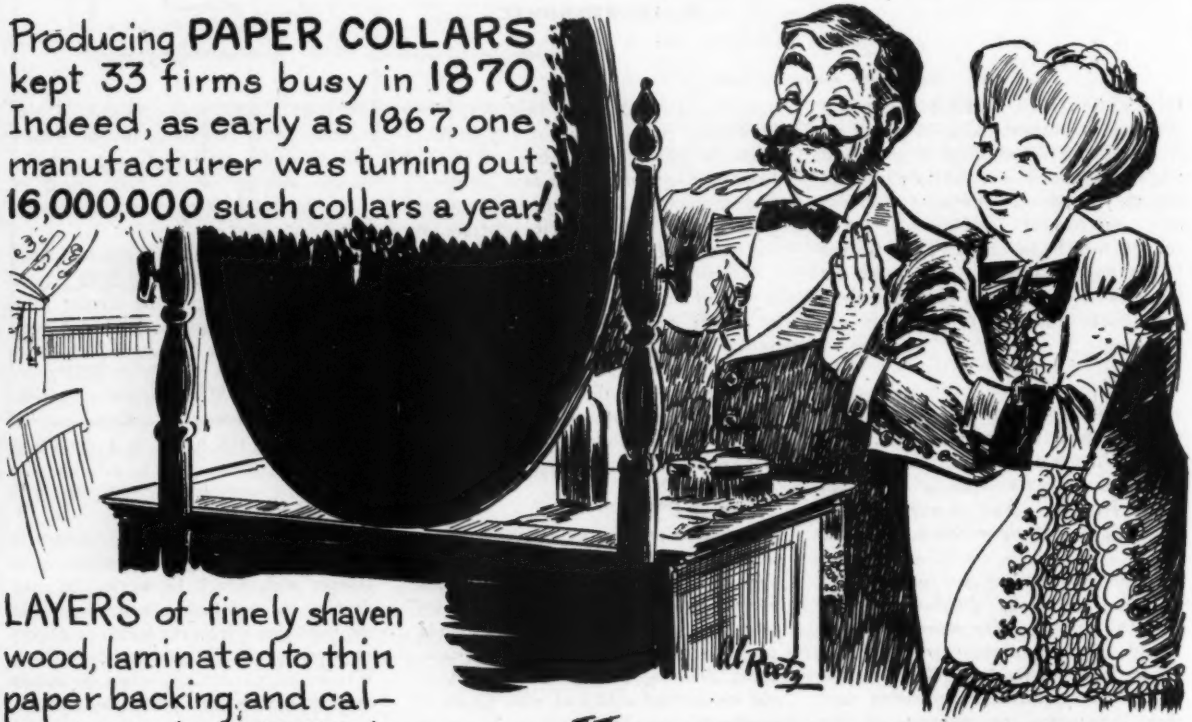
In making boxes of paper and pasteboard, workers are in contact with moist glues and pastes which produce dermatitis of hands and forearms. "Stripping," i.e., pasting strips on the sides and tops of the pasteboard forms, is done by a machine, but in many plants the machines are not automatic and require hand operations.

A long strip of paper passes through a bath of liquid glue. The worker tending the machine uses the fingers to guide the strip. The fingers, especially the right index, are coated with moist glue. Numerous cuts from the sharp edges of the paper become filled with glue, and infection may follow. Cuts also occur from the sharp edges of dried glue.

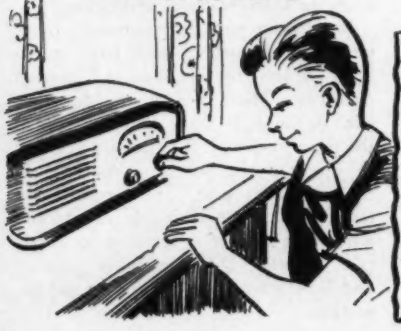
In America with its progressive, modern working methods such hand irritations are less frequent than in European countries. There are many materials used in the daily work of the worker in the paper industry. It is not always easy to discover the irritating material in the individual case. The modern skin test or patch test allows us to find out whether a worker is sensitive to a certain material. Still this takes patience and time from both the doctor and the worker.

PAPER SKETCHES

Producing **PAPER COLLARS** kept 33 firms busy in **1870**. Indeed, as early as 1867, one manufacturer was turning out **16,000,000** such collars a year!



LAYERS of finely shaven wood, laminated to thin paper backing, and calipering only .0005 inch thick, offer a surface suitable for printing, painting, stamping lacquering and polishing. This product—called **MICROWOOD**—is said to bend easily, to have great tensile strength, and to affix readily to all paper and wood **SURFACES**



To lure **HUGUENOT PAPERMAKERS** to England from France during the 1600's, parliament offered them the privilege of including with each ream of paper, 2 quires of spoiled sheets.

Odd Bits

To keep from running out of paper during the Revolutionary War, North Carolina's Safety Council stringently regulated the buying and selling of all paper on the market. ~~~

BUSINESS MEETING held during Wausau gathering was attended by an old friend of the Superintendents Association, Robert Eminger (second from right), past secretary-treasurer of the national association; others included (l to r) L. W. Murtfeldt, retiring division chairman; Harry Weston, national secretary-treasurer; Harold A. Skinner, convention chairman; Gus K. Klaus, new first vice chairman, and John A. McPherson, new second vice chairman

Low Tariffs a Roadblock to Future Profits, Everest Tells Superintendents

INCREASED IMPORTATION of paper and paperboard from European nations to compete with American products on the open market is one of the major hurdles facing the domestic pulp and paper industry. Speaking before an open meeting of the Northwestern Division of the Superintendents Association, D. C. Everest, chairman of the board of Marathon Corp., stressed the danger inherent in a foreign policy "through which we have been giving huge sums of money to so-called 'under privileged countries' . . . to rehabilitate existing manufacturing plants and to build new ones for the production of pulp and paper."

Mr. Everest addressed a joint luncheon during the division's annual fall meeting, which was held September 11 and 12 at the Hotel Wausau, Wausau, Wis. Featured were plant tours and technical sessions, and highlighting the two-day gathering was a special memorial tribute to Fred C. Boyce, Grover Keeth, and Mark M. Whitman, all of Wausau, who were instrumental in the founding and growth of the Superintendents Association.

Discussing future profits and profitable operations, Mr. Everest declared that there are three factors that may seriously affect these goals common to any well-established business enterprise. The first is cost of manufacture and distribution; the second is taxes, and the third is the importation of pulp, paper and paperboard from foreign countries other than Canada. "I do not fear importations from Canada," he said, "as wage rates in Canada are pretty much on a par with those in the United States."

Supply-and-demand still basic

The give-away programs of the various so-called "mutual security" agencies mean that foreign countries—with perhaps very few exceptions—will have to seek their markets in this country or in countries which the U.S. and Canada normally supply, Mr. Everest continued. "The old law of supply-and-demand is still basic when it comes to getting business and making money, which I assume is still the primary object in organizing companies and building plants under the capitalistic system."

The speaker observed that foreign nations show no disposition to help themselves, and that their prime objective seems to be to get "all they can out of us" and then—because of the fact that their wage rates are 10 to 50 per cent of ours—will turn around and dump in the U.S. everything they can make at some profit to themselves if all tariffs are eliminated. This means that supply will be increased, and so far as domestic mills are concerned demand will be lessened.

"All this reacts on American workmen as well as corporations," the speaker continued, "as corporations cannot go on indefinitely losing money and still stay in business. If they suspend business, then a lot of employees' lives are disrupted. . . . I am surprised that both A. F. of L. and C. I. O. union leaders endorse a program which is bound to react on the people they are supposed to represent."

Costs and taxes

Mr. Everest related two other factors to future profits: the cost of manufacture and distribution and taxes. He pointed out that largely because of wage increases the cost of manufacture and distribution have been rising, and that wage rates are not going to be held at a fixed level or decreased in the foreseeable future.

"During periods of so-called prosperity we are all prone to overlook the

Reif New Chairman

At the business meeting on the opening day of the divisional convention, Myles W. Reif of Blandin Paper Co., Grand Rapids, Minn., was elected chairman to succeed L. W. Murtfeldt of Consolidated Water Power & Paper Co., Wisconsin Rapids.

New first vice chairman is Gus K. Klaus of Northern Paper Mills, Green Bay, and the second vice chairman is John A. McPherson of Mosinee Paper Mills Co., Mosinee. Secretary-treasurer for 1953-54 is Robert J. Gilmer of National Container Corp., Ontonagon, Mich. Trustees elected for the year are Harold A. Skinner, general pulp mill superintendent for Marathon at Rothschild, and Richard A. Nugent, manufacturing superintendent for Nekoosa-Edwards Paper Co., Port Edwards.

Myles W. Reif

D. C. Everest

costs of doing business," he said. "The Yankee frugality of our ancestors has disappeared. . . . What look like small items of cost creep in, and it is only when business becomes highly competitive that people get busy on 'self-examination' of the procedures in their own business. . . . Many of these items can be eliminated without serious injury to anyone. . . . The only answer to cost reduction (in the pulp and paper industry) will come through technological developments in the use of wood of various species, particularly hardwoods, and the growing of softwoods within reasonable distances from the pulp mills."

Turning to the question of taxation, Mr. Everest declared that taxes are now taking more than half of the profits of the paper industry. ". . . taxes will continue at what we all consider high rates. There are, however, many expenditures in government which can be curtailed and perhaps completely eliminated, and it is my firm belief that the present administration is determined to do just that."

A good future

Praising the superintendents organization for its phenomenal growth during the 34 years since its founding, Mr. Everest foresaw a bright future for the industry as a whole. Two important facts practically assure this, he said: that none of the paper products in use are what we might term "luxuries," and that there seems to be no stopping to our population growth.

". . . Having lived through the first 34 years and seen the progress you have made," he concluded, "I am convinced that you will continue the good work from now on. Fortunately, in the paper industry there are no two days alike. You will have no chance to fall into a rut. Problems which none of us now foresee will arise to baffle you and those who succeed you, but having noted your performance in the past I have no question about your ability to cope with the problems of the future."

Management comes of age

Calling management the "greatest single group in America," Dr. Louis F. Hackemann told a general meeting on the opening day of the convention that the preservation of democracy depends on sound business leadership. Dr. Hackemann, who is associated with the Industrial Management Institute of the University of Wisconsin, pointed out that the first demand on the individual is self-survival, and that management today is faced with the need of human understanding in a tense world."

He asserted that to meet this challenge men must be trained for management, which requires both technical and administrative skills. Management was always an art, but in the past 30 years it has become a science.

Two contrasting ideologies face the world today, Dr. Hackemann continued, and it will depend on industrial management as to which will win. He said that, no matter how great the national armament is, or how great the nation's statesmen are, the preservation of future freedom will depend primarily on management.

The successful manager today, he continued, must think in the term "We" instead of "I." The needs of management today are many, but the most important is the need for human relations. We live in a tense world, and the great challenge of management is to make people happy, content and relaxed. And in doing this the best kind of manager has to be strong and have preparation for his job.

Social program

Featured on the social calendar was the joint banquet, at which Ray Sayer of Wausau, potentate of Milwaukee's Tripoli Shrine, paid tribute to the late Fred C. Boyce, chairman of the board of D. J. Murray Mfg. Co. and first president of the Superintendents Association; Grover Keeth, chief power engineer for Marathon Corp. at Rothschild and a past president of the association, and Mark M. Whitman, retired sulfite mill superintendent for Marathon and a life member of the association.

Mills visited on Saturday morning by groups of superintendents included Marathon Corp. at Rothschild; the Marathon converting plant at Wausau; Wausau Paper Mills Co., Brokaw; Ward Paper Co., Merrill, and Mosinee Paper Mills Co., Mosinee.

Technical meetings were held concerning the following topics: Broke Handling Methods, Pulp Cleaning, and Moisture Control on Paper Machines. Participating in an open discussion on broke handling were Myles Reif of Blandin Paper Co., Grand Rapids, Minn.; Frank Kreiling, Thilmany Pulp & Paper Co., Kaukauna, Wis., and John Hyatt, Rhinelander Paper Co., Rhinelander, Wis.

The pulp cleaning session was opened with a paper by Harold Pitt, Northwest Paper Co., Cloquet, Minn., titled "Centricleaners on Sulfite Re-Screens." Other speakers were Al Phillips, Consolidated Water Power & Paper Co., Wisconsin Rapids, "Centricleaners on Bleached Mitscherlich;" Clifford White, Northwest Paper, "The Cowan Screen on Kraft," and R. Vogt, Combined Locks Paper Co., Combined Locks, Wis., "Development of a New Pulp Screen at Combined Locks.

Principal participants in the moisture control session were Rod Lunde of Marathon and Russell Knapp of Mosinee Paper.

Speakers Announced for Tappi Engineering, Alkaline Pulping Meetings

PROGRAMS HAVE BEEN announced for the Tappi Eighth Engineering Conference and the Seventh Alkaline Pulping Conference. The engineering sessions will be held October 26-29 at the Sheraton-Mount Royal Hotel in Montreal; while the alkaline pulping meetings will be November 18-20 at the Rice Hotel in Houston, Texas.

Among the various subjects to be discussed at separate meetings during the Canadian gathering will be: Hydraulics, engineering research and machine design, electrical engineering, drying and ventilating, materials handling, mill maintenance and materials, digester corrosion, mill design and economic aspects, and steam and power.

One of the highlights of the conference will be a tour of the Dominion Engineering Co. plant at Montreal.

Full program

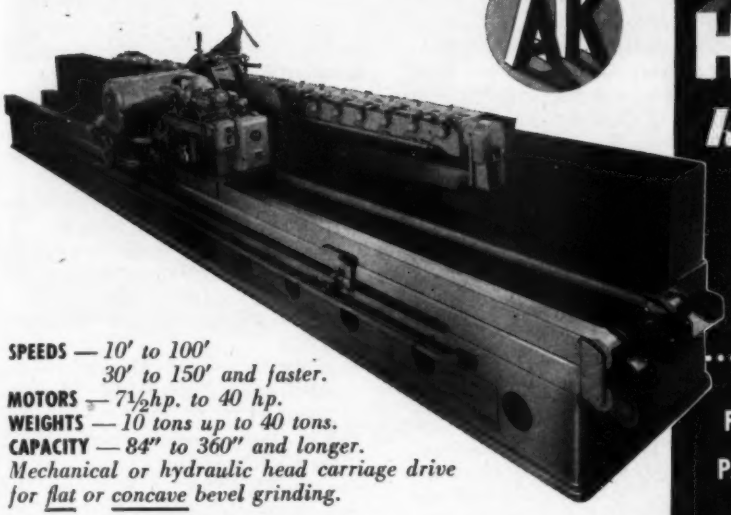
Following a general session on the first day, individual meetings on the various aspects of paper mill engineering will be staged. The speakers for these gatherings are as follows:

Hydraulics—"Progress Report on Pipe Friction Studies," R. E. Durst, University of Maine, Orono.

Engineering Research and Machine Design—"Constant Tension Devices," George C. Ehemann Jr. of Ohio Boxboard Co. and R. C. Berger of General Electric Co.; "The Application Aspects of Paper Machine Differential Drives," Sterling Skinner of Beloit Iron Works, and "The Mechanics of Stress and Strain Occuring in a Fourdrinier Wire," John D. Lyall of Armstrong Cork Co.

Electrical Engineering—"Grounded vs. Ungrounded Power Systems—a Demon-

MODEL AK



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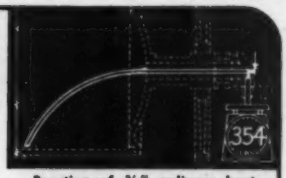
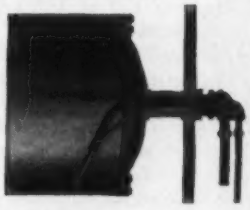
Reaction of ¾″ Auto-Flex in 48″ dia. dryer. Very low leverage.



Reaction of ¾″ ordinary bent pipe. Syphon in 48″ dia. dryer. High leverage.

THIS SYPHON HOLDS ITS POSITION AND SERVES INDEFINITELY

Midwest Auto-Flex syphons have been on the market for years and many thousands are in service for two very excellent reasons — they hold their position — they wear indefinitely.



1. The spring and brace holds the end of the pipe at the proper distance from the bottom of the dryer. It cannot take any other position—hence, proper water and air removal.

2. The cantilever leverage exerted is lower than with bent pipe syphons, only 170# vs 354#. It clears instead of dragging on the journal and rapidly wearing out.

Order a get acquainted dozen. Performance guaranteed.

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DAYTON, OHIO

stration; Review of Operating Experiences," George P. Hobbs of Bowaters Newfoundland Pulp & Paper Mills Ltd. and R. H. Kaufmann of General Electric, and "An Engineering Analysis of Downtime of Electric Section Drives" by R. F. Sorenson of Union Bag & Paper Corp.

Drying and Ventilating—"Variation of Drying Rates of Industrial Dryers Through the Dryer Section," A. E. Montgomery of J. O. Ross Engineering Corp., and "The Mason-Neilan Moisture Drying Control System for Paper Machines," J. M. McAleer of Mason-Neilan Regulator Co.

Materials Handling—"Use of Gasoline vs. Electric Trucks in the Paper Industry," R. F. Weber of International Harvester Co., and "Economics of Various Methods of Handling Mill Supply Chemicals," H. A. Stoess Jr. of Fuller Co.

Mill Maintenance and Materials—"The Maintenance of Bleach Plant Equipment," Harold H. Huseby of Northwest Paper Co., and "The Application of Noncorrosive Materials," George Lydick of Beckett Paper Co.

Digester Corrosion — "Comparative Analysis of Digester Corrosion Measurements," T. E. Caywood of Armour Research Foundation; "Promising Indications of Causes of Corrosion in Alkaline Pulping Equipment," Claude B. Christiansen of the Pulp & Paper Research Institute of Canada, and "Safety Evaluation and Protection of Digesters," W. B. Parker of Hartford Steam Boiler Inspection & Insurance Co. and H. M. Canavan of Mutual Boiler & Machinery Insurance Co.

Mill Design and Economic Aspects—"Fire Protection in Pulp and Paper Mills," R. C. Max of Factory Insurance Association, and "Industrial Plant Building in Canada," F. M. Kraus of Stadler, Hurter & Co.

Steam and Power—"The ASME Boiler Code and its Applications in the United States and Canada," E. C. Korten of Hartford Steam Boiler Inspection & Insurance Co., and "Case History of an 850 psig Topping Turbine Installation," H. R. Emery of St. Regis Paper Co. and P. H. Nelson of Chas. T. Main, Inc.

At noon on the final day of the Montreal meeting, Douglas W. Ambridge, president and general manager of Abitibi Power & Paper Co. Ltd., will discuss "The Urgent Needs of the Industry."

Alkaline pulping meeting

The Houston gathering will feature a tour of the Pasadena mill of the Champion Paper & Fibre Co. and, for those who can make the trip, a visit to Southland Paper Mills Inc. at Lufkin. Lufkin is 120 miles north of Houston.

Speakers scheduled for the Seventh Alkaline Pulping Conference are as follows:

Pulp Washing—"Current Report on Pressure Washing," Lionel M. Sutherland and William S. Mounts of Sutherland Refiner Corp.; "Pulp Wash Water-Supply, Heating and Operating Problems," J. M. Ralston and Maurice Klein of Union Bag & Paper Corp., and "The Valveless Washer," J. K. Perkins of Improved Machinery Inc.

Pulp Washing and Screening—"Effect of Digester and Liquor Room Operation on Pulp Washing," Wilber Orr of St. Regis Paper Co.; "The Efficiency of a Four-Stage Pulp Washer vs. a Three-Stage Washer in a Kraft Mill," E. A. Harper and Fritz Paul of Hudson Pulp & Paper Corp.; "Performance of Cowan Screens on Kraft Pulp," E. H. Smith and W. S. Gardner of Crossett Paper Mills, and "Flat Screen vs. Ahlfor Screen for Bleachable Pine and Hardwood Sulphate Pulps," Roy Homans and Malcolm Pineo of Brunswick Pulp & Paper Co.

Pulp Screening—"The Use of Centri-Cleaners and Vortraps on Semichemical Pulp," A. L. Wiley, A. E. Stafford and Russell Adams of Riegel Carolina Corp.; "Selective Particle Separation by Controlled Fluid Forces on a Flat Screen," H. F. Schenk of Magnus Metal Corp.; "Use of High Intensity Screens in Sulphate Pulping for Coarse Papers," F. Cooper Ratliff of Gaylord Container Corp.; "Use of a Jackson-Church Press in Handling Pulp Mill Rejects," R. E. Bringman of St. Joe Paper Co., and two additional papers on "Pulp Washing and Screening."

Semichemical Pulping—"The Influence of Fiberizing Variables in Producing Semichemical Pulp in a Commercial Disk Mill," Frederich A. Aflenzer of the U. S. Forest Products Laboratory, Madison, Wis., and "Continuous High-Yield Kraft Pulping of Douglas Fir Lumber Waste," D. J. MacLaurin and J. F. Whalen of the Institute of Paper Chemistry, Appleton, Wis.

At the luncheon meeting on the conference's opening day the speaker is to be Karl R. Bendetsen, formerly the Undersecretary of the Army and presently general consultant and assistant division manager for the Texas Division of Champion at Pasadena.

Mimms Elected Chairman of Michigan Supts.

Leon Mimms of Kalamazoo Paper Co. has been elected chairman of the Michigan Division of the Superintendents Association for 1953-54. The election took place July 14 at the Kalamazoo Country Club.

Other new officers include: Harrison Kindig, Mac Sim Bar Paper Co., first vice chairman; Claude Bos, St. Regis Paper Co., second vice chairman, and Marshall Rutz, Kalamazoo Vegetable Parchment Co., secretary and treasurer.

Coming Events

TAPPI meetings

Oct. 15-16—Third Corrugated Containers Conference, Statler Hotel, New York, N.Y.

Oct. 22—Delaware Valley Section, Engineers' Club, Philadelphia.

Oct. 26-29—Eighth Engineering Conference, Sheraton-Mount Royal Hotel, Montreal.

Nov. 3—Pacific Section, Longview, Wash.

Nov. 18-20—Seventh Alkaline Pulping Conference, Rice Hotel, Houston, Texas.

Dec. 4—Delaware Valley Section, Engineers' Club, Philadelphia.

Jan. 19—Pacific Section, West Linn, Ore.

Feb. 15-18—39th Annual Meeting, Commodore Hotel, New York, N.Y.

American Pulp & Paper Mill Superintendents Association meetings

Oct. 20—Miami Valley Division, American Legion Hall, Middletown, Ohio.

Oct. 23-24—Pennsylvania-New Jersey-Delaware Division, Pocono Manor, Pocono Manor, Pa.

Oct. 28-30—Southern and Southeastern divisions (joint meeting), Edgewater Gulf Hotel, Edgewater Park, Miss.

Dec. 4-5—Pacific Coast Division, New Washington Hotel, Seattle.

Jan. 26—Miami Valley Division, American Legion Hall, Middletown, Ohio.

Feb. 25—Miami Valley Division, American Legion Hall, Middletown, Ohio.

Other meetings

Oct. 19-23—National Safety Congress, Pulp and Paper Section, Conrad Hilton Hotel, Chicago.

Oct. 20-22—1953 Industrial Packaging and Materials Handling Exposition, sponsored by the Society of Industrial Packaging and Materials Handling Engineers, Boston.

Oct. 27—Association of Consulting Chemists and Chemical Engineers, Hotel Belmont Plaza, New York, N.Y.

Nov. 4-6—National Paperboard Association, annual meeting, Waldorf-Astoria Hotel, New York, N.Y.

Dec. 6-8—Chemical Specialties Manufacturers Association, 40th annual meeting, Mayflower Hotel, Washington, D.C.

Dec. 13-16—American Institute of Chemical Engineers, annual meeting, Hotel Jefferson, St. Louis, Mo.

Jan. 27-29—CPPA Technical Section, annual meeting, Sheraton-Mount Royal Hotel, Montreal.

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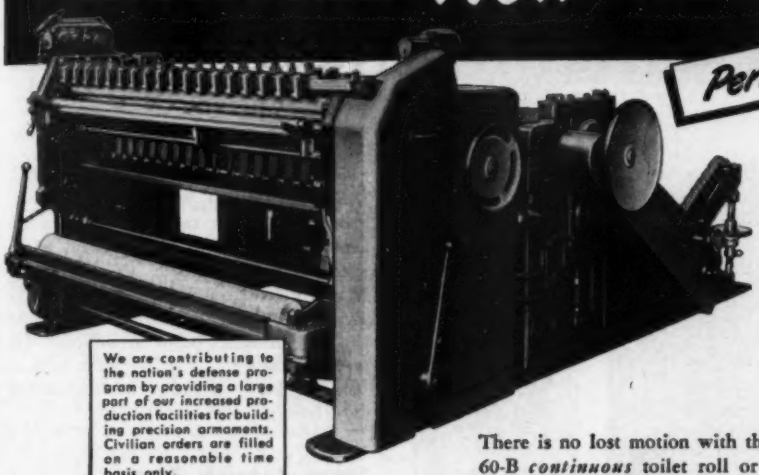
Cuts *Perforates* *Slits*



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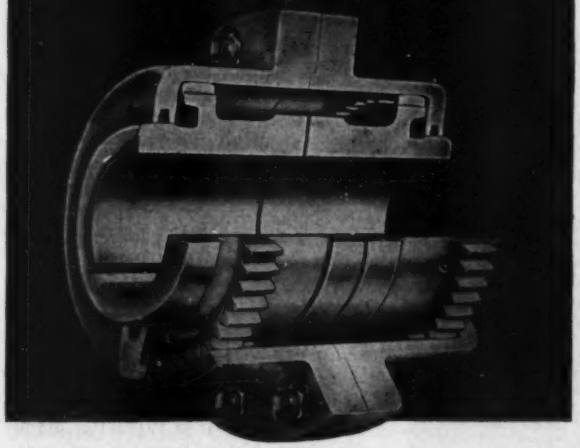

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The Paper Industry Names in the News

K-C Names Medical Director

DR. GORDON PETERSEN has been named medical director of Kimberly-Clark Corp., Neenah, Wis. He was formerly superintendent of sanitary products development in the research and development laboratories.

Kimberly-Clark's first full-time medical director, Dr. Petersen will be closely associated in his new assignment with Dr. J. B. MacLaren, who becomes associate director after 29 years as the firm's medical consultant and the last six years as part-time medical director.

Dr. Petersen received his medical degree from the University of Wisconsin in 1932. He served a rotating internship at California Hospital in Los Angeles before going to Brooklyn, N.Y., for a year's internship in obstetrics and gynecology at Long Island College Hospital. He was later assistant resident and resident physician at the University of Wisconsin. After further medical work at Louisville, Ky., and Greenville, Miss., he joined Kimberly-Clark and has been associated with that firm 14 years except for three years of service in World War II.

Dr. Gordon Petersen

R. L. Zale

Appointments at Gypsum

National Gypsum Co. of Buffalo, N. Y., has announced the appointment of *ROBERT L. ZALE* to the newly created position of products promotion manager. He was formerly assistant to the advertising manager of the Toastmaster Products Division of McGraw Electric Co., Elgin, Ill.

The firm also reported the following promotions in plant personnel. *FRANK L. BREEN*, formerly plant manager at Trenton, N. J., has been made technical field service representative in the research department. Replacing Mr. Breen at Trenton is *ROBERT L. KILGORE*, previously plant manager at Dover, N. J. *HENRY J. REED* assumes the Dover managership.

S. A. Casey

N. E. Nash

Management Realignment at Nepco

Due to the death of Walter A. Radke (see Necrology), vice president and treasurer of Nekoosa-Edwards Paper Co. at Port Edwards, Wis., the board of directors has realigned the management organization.

In addition to their present duties as vice presidents, *SAMUEL A. CASEY* was appointed treasurer and *NEIL E. NASH* secretary. And *ALBERT S. PUELICHER*, president of Marshall & Ilsley Bank in Milwaukee, was named vice chairman of the board of directors.

Successor to Dr. West Appointed by Institute

Westbrook Steele, president of the Institute of Paper Chemistry at Appleton, Wis., has announced the appointment of *JACK WEINER* as editor of the Institute, succeeding the late Dr. C. J. West.

Mr. Weiner comes to the Institute from the Library of Congress, where he has held positions in the Technical Information Division since 1948. Prior to his affiliation with the library, he had been active both as an organic research chemist and as a literature research chemist. Mr. Weiner was to have assumed his new duties at Appleton in mid-September.

Marathon Changes

Four personnel changes at Marathon Corp.'s Menominee, Mich., plant have been announced by Norman H. Foley, resident manager.

EDWARD C. CHRISTENSEN has been transferred to Menominee from Menasha, Wis., to replace *CLEMENT J. BERTAGNOLI*, who has been named supervisor of the salary administration department's analytical section at Menasha. And *RUDOLPH H. RISTOW JR.*, former assistant plant and property accountant at Menasha, has been sent to Menominee as plant accountant. He replaces *GERRY YACH*, who is now senior analyst in industrial accounting at Menasha.

Stone Appoints Two

The appointments of *BEN WEESNER* as general superintendent and of *JOSEPH J. FIORI JR.* as superintendent at the Franklin, Ohio, paperboard mill of Stone Container Corp. were announced recently by Marvin N. Stone, vice president in charge of operations.

Mr. Weesner, who has more than 45 years' experience in the industry, was formerly superintendent of the Chicago plant of the Coated Board Division, Container Corp. of America; while Mr. Fiori has been plant engineer and purchasing agent at the Franklin Division since 1949.

Sorg Promotes Three

Sorg Paper Co. of Middletown, Ohio, has announced the following appointments within the Operating Division organization.

CLAUDE A. SORG, who formerly served in the capacity of production manager, has been named director of paper manufacturing; *DONALD J. GOODMAN*, technical superintendent of paper manufacturing, has been made general superintendent in charge of the Sorg, Oglesby and Smith mills, and *CARL H. EISENMENGER*, assistant to the vice president for operations, has been named general superintendent in charge of finishing, traffic, receiving, and standards.

Mr. Sorg has served the firm for more than 40 years, having joined the Paul A. Sorg Paper Co. in 1911 after graduation from Notre Dame University. He spent some years in the plant, after which he moved into the office, where he worked closely with the late Frank A. Smith. At the time of Mr. Smith's 1939 retirement, Mr. Sorg was made mill manager of the Sorg operation and subsequently production maanger for all mills.

Mr. Goodman began his career with the firm in 1938 as a chemist in the laboratory. He was subsequently appointed to the positions of assistant technical director, technical superintendent of the Sorg mill, and in July 1951 to technical superintendent of paper manufacturing.

Mr. Eisenmenger has been with Sorg nine years, having started as production clerk in the manufacturing division. He was later made supervisor of standards and in 1948 was named assistant to the vice president of operations.

E. A. Charlton Joins H. K. Ferguson as Executive

E. A. CHARLTON, for the past three years president and general manager of Central Paper Co. in Muskegon, Mich., has joined H. K. Ferguson Co. of Cleveland, engineers and builders. He will serve in an executive capacity.

Prior to his association with Central Paper, Mr. Charlton was a New York, N.Y., paper consultant. He has also been vice president in charge of operations for International Paper Co. and Canadian International Paper Co.; general manager for Crossett Paper Mills, Crossett, Ark.; manager of the New York World Paper Mills, New York, N.Y., and paper mill superintendent for Brompton Pulp & Paper Co., East Angus, Que.

E. A. Charlton

E. P. Ingalls Jr.

EVERETT P. INGALLS JR., mill manager for S. D. Warren Co., Cumberland Mills, Maine, has won first prize in the Sixth Bolton Award Contest conducted by John W. Bolton & Sons Inc. under the sponsorship of the Superintendents Association. The title of his paper was, "Harvest from Happiness." The general topic of the competition was, "The Obligations of a Company to Its Employees."

National Container Reports Georgia, Florida Changes

National Container Corp. has announced the following appointments and personnel changes at its Jacksonville, Fla., and Valdosta, Ga., mill divisions.

KARL M. GUEST, former plant manager at Jacksonville, has been made plant manager at Valdosta. *J. E.*

10
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PLURONICS* — Mill evaluations show that PLURONIC F68, the only 100%-active flake nonionic surfactant, improves absorbency and softness of paper towels. It is an excellent paper softener, with a minimum reduction in strength. PLURONIC F68 with sulfamic acid is excellent for washing felts . . . increases felt-life as much as 100%.

PURECAL* — Wyandotte's ultra-white precipitated calcium carbonate is exceptionally uniform in quality and particle size, free of grit and abrasives, readily and easily dispersed. PURECAL produces a smooth coating of high whiteness, good hiding power, and excellent inking qualities.

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MAILHOS, formerly plant engineer at Jacksonville, has assumed a similar post at the Georgia plant. He is succeeded at Jacksonville by *R. V. PENNINGTON.*

H. M. BURNETTE, formerly maintenance superintendent at Jacksonville, has been transferred to Valdosta in the same capacity. His successor is *R. E. ADAMS,* construction engineer at Jacksonville. *WILLIAM J. MILES,* the former master mechanic at Jacksonville, is named master mechanic at the Georgia plant. His successor is *E. ANDERSON,* assistant master mechanic at Jacksonville.

The $25,000,000 Valdosta mill for the manufacture of kraft pulp, board and paper is expected to be in operation during the last quarter of this year.

Industry Men Named by Controllers Institute

NELSON T. HAMPSON, treasurer of Lowe Paper Co. in Ridgefield, N. J., has been elected president of the New York City Control of the Controllers Institute of America. *W. S. ROTHWELL,* comptroller for Abitibi Power & Paper Co. Ltd., has been similarly honored by the organization's Toronto Control.

The new president of the Dallas group is *CLAIBORNE H. JOHNSON,* controller of Fleming & Sons Inc. At the annual meeting of the Twin Cities Control, *E. A. JOHNSTON,* controller for Minnesota & Ontario Paper Co., was elected first vice president. A similar office was voted to *RALPH B. KNOTT,* vice president in charge of finance of Fibreboard Products Inc., San Francisco, by the local controllers' organization in that city.

In Montreal *T. CECIL DAVIS,* comptroller of St. Regis Paper Co. (Canada) Ltd., has been made vice president of the local Institute branch, while *JOHN R. LESLIE,* controller of Howard Smith Paper Mills Ltd., has been named a director.

JOSEPH A. CHADBOURNE, president of Old Colony Envelope Co. in Westfield, Mass., has been renamed secretary and treasurer of the Springfield Control. And *JAMES A. V. NORMAN,* secretary-treasurer of Specialty Papers Co., has been elected secretary of the Dayton Control.

Among directors elected by other local branches of the Institute are: *SETH L. BUSH,* treasurer of Port Huron Sulphite & Paper Co. (Detroit Control); *KARL W. COOKE,* secretary and treasurer of Southland Paper Mills Inc. (Houston Control); *PAUL DICKMEYER,* controller of Fort Wayne Corrugated Paper Co.; *HOMER L. DILLARD,* controller of the Champion Paper & Fibre Co. (Cincinnati Control), and *HUGH*

J. EVANS JR., comptroller of J. L. N. Smythe Co.

ANTON ROESER has been appointed superintendent of the converting department of Charmin Paper Mills Inc., Green Bay, Wis. A veteran of 26 years with the firm, he succeeds *JOSEPH ROSKAMS*, who is joining the technical staff. Beginning his career in the core and box making departments, Mr. Roeser has had experience in all phases of converting operations. For the past four years he served as assistant converting department superintendent.

Anton Roeser

R. P. McDonald

RALPH P. McDONALD has been made general production manager for Fibreboard Products Inc., San Francisco. He has been assistant resident manager of the Antioch Division. *DR. R. W. K. ULM*, formerly technical director of the San Joaquin Division, succeeds Mr. McDonald at Antioch.

RUSSELL F. MANNEY, formerly associated with an advertising agency, has joined Wolf Detroit Envelope Co. as manager of the dealer service division.

CHESTER CURTIS, vice president of Munising Paper Co. at Munising, Mich., for the past nine years, has resigned his position to accept a similar one with Mastic Asphalt Co., South Bend, Ind.

HARRY McGOVERN has resigned as a director and vice president for manufacturing of River Raisin Paper Co., Monroe, Mich. He plans to enter business for himself.

R. S. JOHNSON, chief forester for Mersey Paper Co. Ltd. at Liverpool, N.S., has been named chairman of the newly organized Nova Scotia Foresters Forum.

HARRISON B. RUE has been named manager of the Buffalo, N.Y., plant of Chase Bag Co. He succeeds *PAUL L. ULLMANN*, who has been transferred to the Kansas City branch.

FRED C. GOODWILL, resident manager of St. Regis Paper Co.'s Kalamazoo mill, has been named assistant to Wil-

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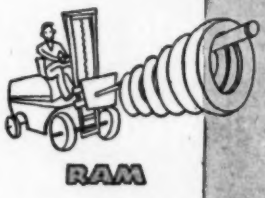

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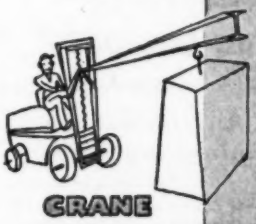

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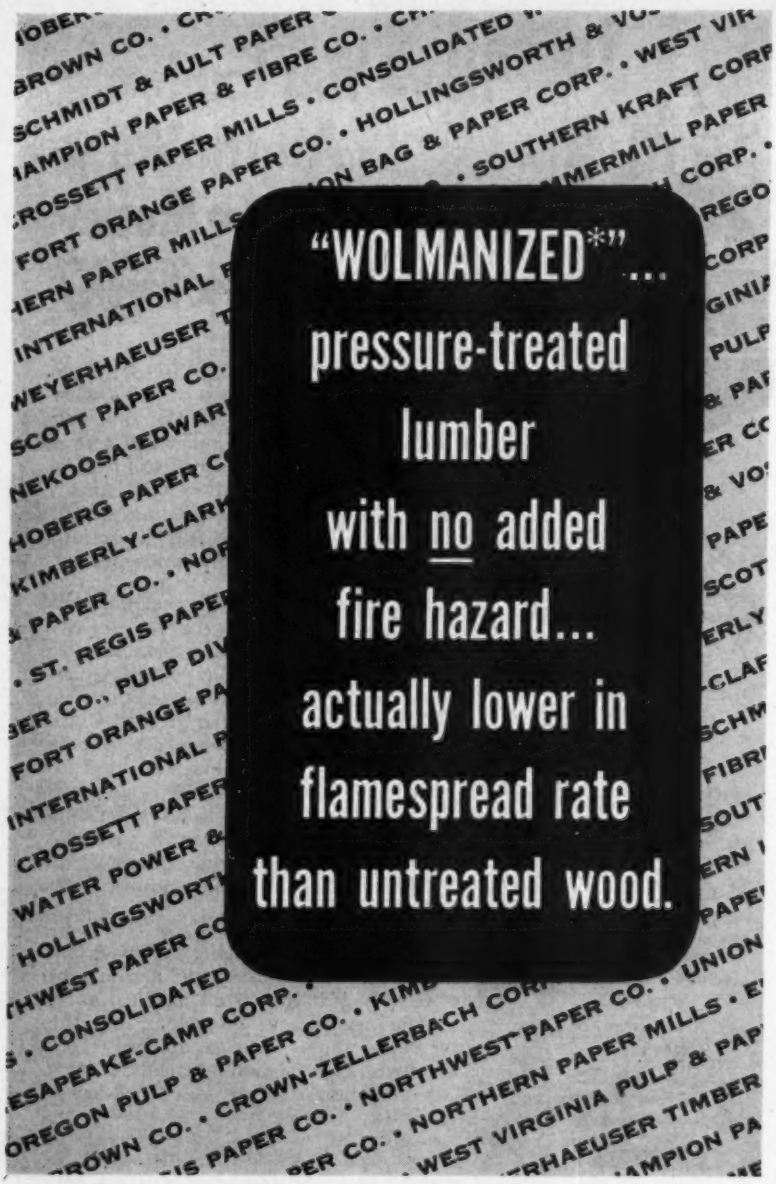

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liam R. Adams, St. Regis vice president in charge of manufacturing. Succeeding Mr. Goodwill at Kalamazoo is *LEONARD A. PIERCE JR.*, who for the past six months has been his assistant.

HAROLD BOESCHENSTEIN, chairman of Fiberglas Canada Ltd., has been elected a director of International Paper Co.

GEORGE D. BEARCE, general manager for St. Regis Paper Co. at Bucksport, Maine, has been elected to the forest products section of the Committee on Natural Resources of the Chamber of Commerce of the United States.

A. J. BREWSTER has been appointed acting division manager in charge of operations at Robert Gair Inc.'s Teterboro (N.J.) corrugated box division.

DR. LINTON E. SIMERL, formerly in the engineering department of Marathon Corp., and *ARTHUR H. LANDROCK*, at one time associated with Continental Can Co., have been appointed to the research and development department of the Cellophane Division of Olin Industries Inc.

H. MORREY CROSS has been named assistant superintendent of the technical control department of Canadian International Paper Co. at Three Rivers, Que. For the past five years he has been assistant superintendent of technical control at the Dalhousie mill of New Brunswick International Paper Co.

ROLAND K. FRASER has been named product development manager for Nashua Corp., Nashua, N.H. Mr. Fraser started his career with Nashua in the sales research department and subsequently became product development engineer.

DR. H. F. LEWIS of the Institute of Paper Chemistry, Appleton, Wis., was one of two Wisconsin men named to the eight-member United States delegation to the 17th Conference of the International Union of Pure and Applied Chemistry. The gathering was staged July 29 to August 7 at Stockholm, Sweden. The other Wisconsin member was Dr. Farrington Daniels of the state university.

RALPH J. SHEMANSKI has been named comptroller and assistant treasurer of Kimberly-Clark Corp., succeeding *EDWARD DAVITT*, who becomes financial vice president of International Cellucotton Products Co. Mr. Shemanski, who has been comptroller of Long-Lac Pulp & Paper Co. Ltd., a K-C subsidiary, has been associated with the firm

for 29 years. Succeeding Mr. Shemanski at LongLac is *ALBERT R. McCOL*, who has been general accountant.

J. D. ZELLERBACH, board chairman of Fibreboard Products Inc. and president of Crown Zellerbach Corp., has been appointed an alternate delegate to the United Nations.

ALFRED J. FREITAG has been made supervisor of the tabulating department of Consolidated Water Power & Paper Co. He has been an employee of the firm 20 years, most recently as property accountant.

LOWELL M. McGINNIS has been named assistant pulp mill superintendent of the Jesup, Ga., mill of Rayonier Inc. It is expected that he will assume his duties October 1. With Rayonier since 1940, Mr. McGinnis was formerly shift superintendent at the Shelton, Wash., mill.

J. BICKNELL LOCKHART JR. has been elected to the board of directors of Riegel Paper Corp. He is manager of the firm's Warren, Riegelsville and Hughesville mills in New Jersey.

HOWARD E. WHITAKER, president of the Mead Corp., is moving his headquarters from Chillicothe, Ohio, to the main offices in Dayton. He will continue to spend a portion of his time at Chillicothe, where the firm's operating offices are located.

Marathon Corp. has announced the election of two new members of its board of directors: *MILAN BOEX*, president of Northern Paper Mills, newly acquired Marathon subsidiary, and *WILLIAM E. BUCHANAN*, a Northern director and president of Appleton Wire Works.

DR. KEITH MAX has been named assistant to Norman F. Greenway, vice president in charge of the folding carton division of Robert Gair Co. Inc. Dr. Max will supervise paperboard production. Since 1949 he has been assistant technical director of the firm's research department.

HENRY VRANIAN has been appointed sales manager of Chesapeake Corp., West Point, Va., to succeed the late W. C. Gouldman. Mr. Vranian has been with the firm 19 years, having served as chief chemist and later as assistant general superintendent.

O. H. STIEBER, acting general traffic manager for Gaylord Container Corp., has been elected president of the newly formed metropolitan St. Louis chapter of Delta Nu Alpha, national transportation fraternity.

The Paper Industry Necrology

Harry Calvin Bradford

Harry Calvin Bradford, 71, vice president and secretary of Rex Paper Co. of Kalamazoo, died September 6.

A member of both the Superintendents Association and Tappi, Mr. Bradford was at one time chairman of the Kalamazoo Valley Technical Committee for Stream Control. He was president of the Izaak Walton League in 1948.

Walter A. Radke

Walter A. Radke, 54, vice president and treasurer of Nekoosa-Edwards Paper Co., died in Port Edwards, Wis., September 8.

A native of Columbus, Wis., Mr. Radke began his career as a bookkeeper in 1914 at the Nekoosa State Bank. Following several promotions, he became bank president in 1933, a position he held until the time of his death.

In July of 1948 he was named director of Nepco, its treasurer the following January and vice president only last July. A graduate of the American Institute of Banking, Mr. Radke also held these positions: vice president and director of Nekoosa-Port Edwards Building & Loan Association; director of Nekoosa Foundry & Machine Works; treasurer of Tomahawk Timber Co., and vice president and director of the Nepco Foundation, a non-profit organization set up by the paper firm to promote educational, religious, scientific, and charitable aid to the needy and worthy throughout Wisconsin.

T. W. Seidel

Thomas W. Seidel, 56, general superintendent of Bergstrom Paper Co., died September 2 at his home in Neenah, Wis.

A native of Rib Lake, Mr. Seidel was named Bergstrom superintendent in May 1943. He had been employed at the mill for 32 years, beginning as a fifth hand in 1921. He had served with the Allied Expeditionary Forces during World War I and had been awarded the Distinguished Service Cross by Gen. John J. Pershing.

Mark M. Whitman

Mark M. Whitman, 79, retired sulfite mill superintendent of Marathon Corp. at Rothschild, Wis., died September 1 at a Wausau hospital.

Mr. Whitman joined the Marathon staff in 1914 and remained with the firm until his retirement in 1942. From 1918 until his retirement he was sulfite superintendent; he had previously been woodyard superintendent. Earlier work in the paper industry included associations with mills at Kaukauna, Wis. (his birthplace); Munising, Mich., and International Falls, Minn. Mr. Whitman was a life member of the Superintendents Association.

Stephen B. Stafford, 72, secretary of Rice Barton Corp., died September 8 at Worcester, Mass. Mr. Stafford joined the firm in 1897 as an apprentice. He served in all departments and held such positions as chief engineer and sales engineer. At the time of his death he was a director.

S. B. Stafford

L. S. Altholz

Leo S. Altholz, for four decades associated with Inlander-Steindler Paper Co. of Chicago, died in September at the age of 59. Having started his career with the firm as a truck driver, Mr. Altholz became president in January 1953. He is being succeeded by his son, Herbert, formerly executive vice president.

Samuel Katz, 59, board chairman of Gibraltar Corrugated Paper Co. in North Bergen, N.J., died at Port Chester, N.Y., August 19.

Henry Nitzbond, 58, a mechanical engineer for Marathon Corp., died in Menasha, Wis., August 7.

Joseph H. Butler Jr., 53, vice president and assistant general manager of Inland Empire Paper Co. at Millwood, Wash., died recently in his Spokane home. A native of Pennsylvania, he joined the firm in 1919 as a feeder room employee.

The Paper Industry Safety News

Crossett Leads Member Mills in Southern Safety Association

For the first six months of 1953, Crossett Paper Mills of Crossett, Ark., led all other members in the Southern Pulp & Paper Safety Association's annual competition. In that period, Crossett recorded an accident frequency rate of 0.00 in 812,011 man-hours of exposure. (The rate is based on injuries per 1,000,000 man-hours worked.)

Leader at the end of the first quarter was Gulf States Paper Corp., Tuscaloosa, Ala. Gulf States has dropped to seventh position, with a frequency rate of 0.59 in 1,675,054 man-hours. Crossett was in third position at the end of three months. The mill's safety director is R. E. Bell.

For the entire membership, the injury frequency rate at the half-way point was 8.50. This was down from the 9.78 of 1952 and the 10.13 of 1951.

Five mills in addition to Crossett reported no injuries for the first six months. They were as follows (man-hours of exposure in parentheses): Brunswick Pulp & Paper Co., Brunswick, Ga. (670,505); The Flintkote Co., Meridian, Miss. (469,644); The Mead Corp., Sylva, N. C. (360,891); The Mead Corp., Harriman, Tenn. (247,616), and Mead at Nashville (115,901).

Converting industries

Among bag plants in the Converting Section, Gulf States Paper was the leader with a rate of 0.00 in 637,712 man-hours. Only one of the remaining 10 competitors in the section had a rate of less than 1.00. That was Union Bag & Paper Corp. at Savannah, Ga.

Bag plants reporting in the first half showed an over-all frequency rate of 12.18, up from 1952's and 8.78 and 1951's 12.12.

Box plants reporting to the association showed an over-all frequency rate in the first six months of 15.52. For the year 1952 the figure was 13.96, and for 1951 it was 9.39.

Leader among box plants was Union Bag & Paper at Savannah, with a rate of 13.26 in 376,974 man-hours. The leader at the three-month mark was the Southern Container Division of National Container Corp. at Jacksonville. The plant has now dropped to third place with a rate of 14.63 in 341,666 man-hours.

Three firms reported no disabling injuries in their woods operations for the first half. They were Union Bag & Paper at Savannah (253,085); St. Regis Paper Co. at Pensacola, Fla. (100,112), and Mead at Lynchburg, Va. (1,902).

In woods operations, the average injury frequency rate among the seven firms reporting was 17.24. In 1952 it was 20.75, while in 1951 it was 49.29.

Woods Operations Comes of Age in Safety

Safety in the woods, an idea that was once considered a minor chapter in the paper industry, is now paying real dividends in safer working conditions for the woodsmen of The Ontario-Minnesota Pulp & Paper Co. Ltd.

"We have a long way to go," says J. F. MacKellar, vice president and general manager of O-M, "but we have made headway." Woods accidents are now not so numerous, he continued. Camps are setting accident-free day records comparable with mill records. One of the division's camps has a record of 275 accident-free days.

Recently, the Kenora division received the Ontario Pulp and Paper Makers Safety Association's Provincial Award for 1952 for having a woods accident frequency rate of 56.3, the lowest in Ontario. O-M has won this award twice before, once at Kenora and once at Fort Frances, and has also a second place rating to its credit.

Specific job assignments

Using the same safety methods and principles as applied in the mills, R. W. Croucher, safety officer for the parent firm, Minnesota & Ontario Paper Co., tackled the job of safety in the woods. With the greater part of the woods personnel now working the year around, definite programs have been established and individuals assigned specific safety jobs. Recalling the days when concentration was greatest on harvesting and storing logs, Mr. Croucher said woods operations had no safety program.

The reasons were obvious: The average woods worker was of the itinerant type, exclusive of key men retained on a yearly basis; there were few skilled employees on the payroll; the mechanical age in the bush had not yet arrived, and the operations were removed from the close scrutiny of top management.

The concept of forest management changed all this. Year around operations were maintained and conducted from modern community-like camps. The woods workers became rooted family men, and top management took a closer look at woods operations. Harvesting wood on a sustained-yield basis became the father of safer working conditions.

With the change in logging methods it was not long, Mr. Croucher declared, until safety was catching on. The worker, the foreman, the strip boss and all the others who comprise a logging crew looked at safety from a new angle.

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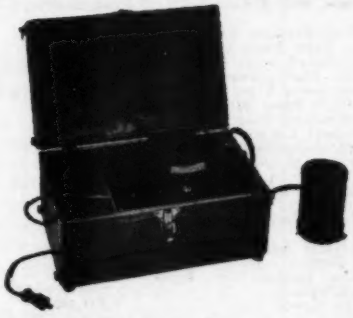

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The Paper Industry Patent Reviews

MELVIN NORD*

Method of Emptying a Pulp Storage Tower

In the papermaking industry it is often necessary to store thick pulp. In order to save floor space, use is often made of high and narrow storage towers. Several difficulties arise in emptying such towers, including movement of the pulp in general and sticking to the walls of the tower in particular.

In U.S. 2,645,378, issued July 14, 1953, to Johan C. F. C. Richter, assigned to Aktiebolaget Kamyr, the pulp is removed from the top of the storage tower by displacing it with water. It has been found that dilution of the pulp occurs only at the contact surface between the pulp and the water, provided there is sufficient air in the pulp. Means are provided to blow in additional air if necessary. When the tower has been emptied of pulp and filled with water, the water may be reused in the plant, preferably as back water, so as to recover the fiber that remains in it.

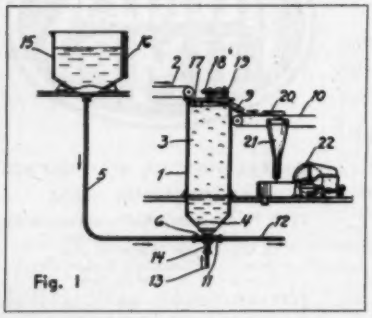

Fig. 1

One method of operation is shown in Fig. 1. Water flows by gravity from tank 15 to the bottom of the storage tower 1. The volume of water (and hence of pulp displaced) is measured by the gauge glass 16 on the tank. Air may be bled in through line 13, along with the water. A rotary scraper 17 at the top of the tower maintains a fixed level of pulp 3, which overflows onto a belt conveyor 10. The pulp may then drop by gravity through a chute 21 into a beater 22.

Apparatus and Process for Coating Paper

U.S. 2,647,842, issued Aug. 4, 1953, to Rudolph N. Griesheimer and Robert C. Hydell, and assigned to The Mead Corp., describes a process and apparatus for applying coating material to a paper web to provide a surface adapted for printing—especially for better grade magazines, including half-tones and multicolor reproductions.

*Patent Attorney, 664 Putnam, Detroit, Mich.

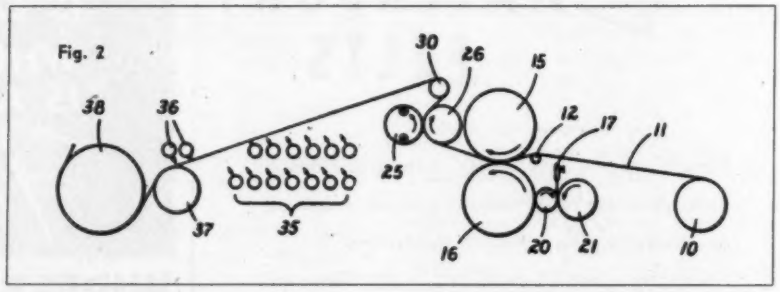

Fig. 2

As shown in Fig. 2, the paper web to be coated is drawn from a roll of suitable paper base stock, and the web 11 is led over a guide roll 12 to pass into the coating color applying zone. The web passes through the nip of the coating application rolls 15, 16. The coating suspension is applied through nozzles 17 to the nip of the rolls 20, 21. The coating materials consist of a mineral such as clay or calcium carbonate and an adhesive such as modified starch or casein, in an aqueous medium. The coating is subjected to smoothing and blending contact with the roll 25. There is substantially no adhesion to the roll surface. This effect is obtained by lowering the temperature of the smoothing roll surface through a refrigerating action, down to —20° to —40°C.

The traveling web, having the stabilized coating material on it, passes over a small diameter fly roll 30. It is then surface dried by passing over a series of hot air pipes 35 and 36. When the web comes into contact with small drier roll 37 which guides

Other Patents of Interest to the Paper Industry

Subject	*Inventor or Assignee*	*Patent No.*	*Date*
Machine for wrapping rolls of paper	Stuart Irvine	2,644,282	7/7/53
Paperbox covering machine		2,644,633	"
Hexagonal paperboard box construction	Louis Schwab	2,644,374	"
Sulfite waste treatment process	Diamond Paper and Box Co	2,644,748	"
Papermaking process utilizing modified locust bean gum	Chempatents, Inc.	2,644,749-52,	"
Method of producing paper bags	Stein, Hall & Co.	2,644,762-65	"
Paper coating machine	Wolf Brothers, Inc.	2,645,166	7/14/53
Apparatus for coating paper	St. Regis Paper Co.	2,645,199	"
Vortex separator for pulp	Combined Locks Paper Co.	2,645,201	"
Collapsible cellular carton	The Black-Clawson Co.	2,645,346-7	"
Paperboard bottle carrier	Sutherland Paper Co.	2,645,402	"
Collapsible covered container	Morris Paper Mills	2,645,403	"
Collapsible and reversible carton	Sutherland Paper Co.	2,645,404	"
Box with carrying handle	Federal Carton Corp.	2,645,405	"
Paperboard box with carrying handle	Add-A-Handle Carton Co.	2,645,406	"
Purifying wood pulp for the manufacture of cellulose acetate	Robert M. Bergstein	2,645,407	"
Purifying wood pulp for the manufacture of cellulose acetate	Celanese Corp. of America	2,645,576	"
Paper pulp foam inhibitor	British Celanese Ltd.	2,645,577	"
Testing paperboard for use as a corrugating medium	General Aniline and Film Corp.	2,645,617	"
Apparatus for defibering slushed paper stock	The Institute of Paper Chemistry	2,645,937	7/21/53
Log debarking machine	The Cowles Co.	2,645,982	"
Electrical precipitator for gases from furnace burning black liquor	Olof R. Kolpe and Oscar B. Andersson	2,646,092	"
Backing paper for roll photographic film	Research Corp.	2,646,132	"
Process of transparentizing paper	Eastman Kodak Co.	2,646,365-6	"
Treatment of papermaking fibers with organosilicon compounds	Robert R. Parmentier	2,646,369	"
Apparatus for mechanically processing wood pulp	Cowles Chemical Co.	2,646,373	"
Folding box	Curlator Corp.	2,646,728	7/28/53
Corner construction for folding boxes	Arthur Bockmann	2,646,915	"
Carton and closure	Bemiss-Jason Co.	2,646,916	"
Bottle carrier	George W. Smith	2,646,917	"
Paper pulp beating engine	Atlanta Paper Co.	2,646,918	"
Waste stripping mechanism for carton blank forming apparatus	Andreas Thorsen	2,647,444	8/4/53
Flap folding apparatus	Gideon Kane	2,647,446	"
Evaporation of waste sulfite liquor	Noble Andre	2,647,447	"
Production of short paper rolls from long paper rolls	Rosenblad Corp.	2,647,570	"
Cellular case	Nicholaus Marcalus	2,647,576	"
	Waldorf Paper Products Co.	2,647,679	"

it into the first main drier drum 38, the coating is sufficiently dry so that it will not adhere to the surface of the drier drums.

Many examples and details of the process, as well as certain modified forms of the invention, are presented in the patent specification. The process is in commercial use at the present time.

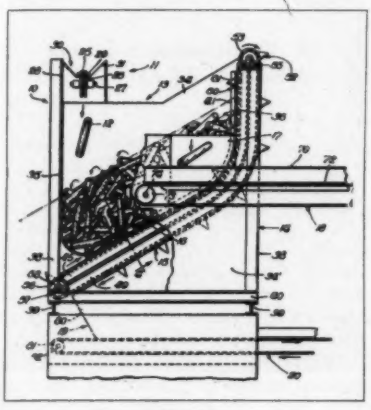

Fig. 3

Short Wood Chain Barker

In U.S. 2,647,548, issued Aug. 4, 1953, to Herbert W. Guettler, a device for removing the bark from relatively short pulp wood logs is described.

As shown in Fig. 3, the apparatus consists of a large stationary vat 13 into which logs are dumped by means of a feed conveyor 11. The vat has a guide chain assembly 15 moving along an inclined bottom 16. These chains tear the bottom layer of logs away from one another to cause a constant turbulent effect. This churning action causes most of the logs to move relative to one another so that the bark is removed by the attritional action between the logs.

Manufacture of Silicate-coated Papers

There has long been an important demand for papers and paper boards which are resistant to oils and greases. Such papers must be resistant to mineral oils, edible oils, aromatic oils, butter, lubricating greases, etc. In the case of papers used for the wrapping of foodstuffs or in the making of cartons for this purpose, color or brightness is also of great importance.

It has long been known that it is possible to increase the grease resistance as well as the stiffness or crushing strength of paper and paper boards by coating them with silicate solutions. These methods have, however, been seriously limited in their applications, due to the fact that almost all paper stocks, especially the cheaper grades, contain components which are subject to staining when contacted with the alkali present in silicate solutions. It is possible to avoid this staining by the use of purified pulps or pulps consisting substantially of cellulosic components, but the high cost of these pulps makes this method prohibitive for most industrial applications.

In U.S. 2,647,069, issued July 28, 1953, to William Stericker, and assigned to Philadelphia Quartz Co., a method is disclosed for overcoming this problem. In essence, it consists of the addition of small amounts of bleaching agents to the silicate solutions. In order for the process to work properly, it is necessary that the silicate solution have viscosities such that penetration of the paper is only partial (i.e. 1 to 50 cp. at 20°C.). The silicates employed must have ratios of alkali metal oxide to SiO_2 within the range 1:1.6 to 1:4. The silicate solutions should contain from 8 to 40 per cent silicate solids and should have gravities within the range 10° to 33.5° Bé for an alkali-silicate ratio of 1:4, and 17° to 55° Bé for a ratio of 1:1.6. The solutions should be applied with a spread of from 2 to 30 lbs. per 1000 sq. ft. of surface. They should contain sufficient oxidizing agent to produce a bleaching action equivalent to that produced by 0.25 to 5.0 per cent by weight of hydrogen peroxide.

These solutions can be applied to the paper at any point after the web is formed and the bulk of the water removed from it. For example, it can be applied by one or more of the final water boxes of the paper machine, or as the web passes through the size press. However, it is preferable to apply the solution in a separate operation.

Any of the oxidizing agents can be used which are useful in the bulk bleaching of paper containing ligneous and other materials subject to alkali staining, such as peroxides, perborates, persulfates, hypochlorites, etc.

Many examples of the method and its results are cited in the patent specification.

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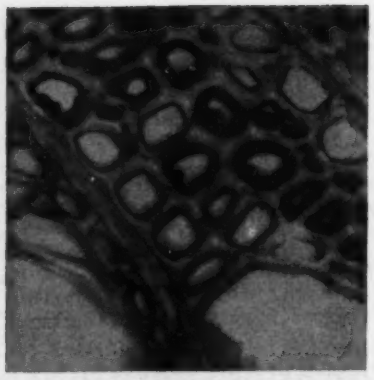
The Paper Industry Foreign Abstracts



Section of poplar wood. The dark areas indicate tension wood stained with zinc chloroiodide

Poplar tension wood; its effect on pulp properties

In wood sections, the tension wood, especially the lumina, is stained blue-violet by zinc chloroiodide (as indicated by the black areas in the accompanying figure), whereas those of normal wood are stained brown. Tension wood contains more cellulose and less lignin or hemicelluloses than does normal wood, and this is reflected in the greatly increased kraft pulp yields from the former. Unless the content of tension wood is known, a satisfactory evaluation of a potential pulpwood is difficult. Although tension wood appears desirable from the standpoint of pulp yields (and brightness of unbleached pulp), the pulp from it is weaker than that from normal wood. Thus, in the latter, the breaking length, folding endurance and tear resistance are all higher than in the pulp from tension wood. The normal wood also hydrates more slowly.

Other effects of tension wood versus normal wood are discussed. The former should give rise to satisfactory dissolving pulps. Georg Jayme and Marianne Harders-Steinhaüser. *Holzforschung*, **7**, 39-43 (1953). (In German.)

A more rapid method for determining cuprammonium viscosity of pulps

So as to speed up the control viscosity method, the following changes are introduced into the usual procedure: (a) thermostatic temperature control; (b) a new capillary viscometer is devised which fits the thermostat and which limits the volume of cuprammonium solution to 25 cc.; (c) manual shaking is eliminated and a special shaking device is developed whereby bleached pulp samples can be dissolved within seven minutes; (d) the usual glass powder flasks are replaced by Vinidor plastic, thus obviating breakage; (e) a special apparatus is constructed to permit rapid filtration and quick drying of moist pulps. Sketches of new pieces of equipment are given. Robert Kroupa and Karl Weinmann. *Wochbl. Papierfabr.*, **81**, 187-89. (In German.)

Influence of temperature in producing semichemical hardwood pulps

By the use of 2.4 per cent NaOH (based on the wood) and a liquor to wood ratio of 10:1, beechwood chips are treated under the following conditions to yield pulps A, B, C, and D: (A) 48 hours at 20°C; (B) 14 hours at 70°C; (C) 6 hours at 100°C, and (D) 3 hours at 150°C. No yield figures are given. All pulps (A-D) contain nearly the same per cent lignin (20.1 to 20.7), but the pentosans decrease with increasing temperatures, from 22.8 per cent for (A) to 18 per cent for (D).

Of the four pulps, (A) shows the most rapid hydration in the beater and the highest brightness. (C) shows the highest relative tear, and its pulp quality increases very markedly on extensive beating. All four pulps show very similar bursting strength. Although (B) and (A) show the greatest breaking lengths, they show very low tear and folding endurance even on protracted beating. The only advantage of (D) is the fairly rapid development of folding endurance with beating.

On the basis of these experiments, the author suggests that semichemical beechwood pulps prepared by treatment at 20-100°C merit attention. R. O. H. Runkel, H. Schambach and H. Witt. *Holzforschung*, **7**, 9-12 (1953). (In German.)

Corrosion of sulfate mill digesters

Seven digesters are kept under observation; these include two stainless steel-lined vessels which are used in cooking eucalypts and pinewood. Average corrosion rates are determined, and the author also gives analyses of materials used in digester construction and of the white and black liquors used. In the case of mild steel, the average corrosion rate of the digesters is about 0.02 in. *per annum*, although in one case this reached 0.031 in. For ordinary cooks it is considered more economical to increase the mild steel thickness to 1.25 in. than to use stainless steel lining or to otherwise line the mild steel.

Various metallic coatings prove unsatisfactory in preventing digester corrosion. If a 5 per cent nickel steel could be used in digesters, this would probably increase the life four times (but such steel is unavailable in Australia). C. E. Perry. *Australian Pulp and Paper Ind. Tech. Assoc. Proceedings*, 1953, 134-47; discussion, pp. 147-8.

Recent developments in the Swedish pulp industry

The author, who is connected with the Central Laboratory of the Cellulose Industry in Stockholm, has outlined some of the more important advances of the industry in Sweden. For example, the tonnage of bleached kraft has largely held its own (despite a recession in 1952). This bleached pulp has a high brightness, regularly at about 84 per cent, and (when chlorine dioxide is used) nearly 90 per cent G.E. brightness. It also has a very high strength.

The seven-stage bleach of such pulps is outlined and the pulp properties compared with those of unbleached samples and pulps bleached by other methods. The pulp bleached in seven stages (including a final chlorine dioxide bleach) shows practically the same tensile strength, burst, and tear resistance as the original unbleached pulp, and has a much higher folding endurance than the initial pulp.

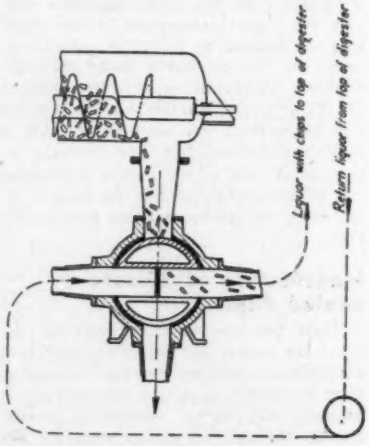


Fig. 1—Mechanism of feeding chips in continuous kraft cooking

Within the past eight years, prehydrolyzed pinewood cooked by the kraft process has given pulp used in tire "cord" manufacture; and in 1952, about 27,000 tons of this pulp were produced, of which 85 per cent was exported. Fengersfors Bruks AB (at Tösse) has undertaken successfully the continuous cooking of kraft pulp, after much experimentation. This pulp now is on a par with other commercial kraft pulps. The mill uses the improved Kamyr equipment, the feeding mechanism of which is shown in Fig. 1, indicating the pocket in a horizontal position. The mill at Tösse is also equipped with a centrally placed control panel, shown in Fig. 2.

The author also discusses, at some length, the recovery and utilization of such by-

products as sulfite alcohol and tall oil, and the burning of sulfite spent liquor, together with some of the engineering problems that are faced in developing this combustion. Calculations indicate that a mill making dissolving pulps can obtain 7½ million B.T.U. (equivalent to 340

Fig. 2—Control panel at the Fengersfors mill

kilos of coal) per ton of pulp, over and above the heat required to evaporate the spent liquor. In the case of a paper pulp mill, this drops to about 5½ B.T.U. Lennart Stockman. *Svensk Paperstidn.*, (Congress number), **56**, 523-530 (1953). (In English.)

Infra-red radiation from propane combustion

The industrial utilization of the radiant heat supplied to the paper industry by the complete combustion of propane in the presence of certain catalysts is discussed. A "Schwank" apparatus is used and this is described briefly. This equipment appears to be more effective than is that using electrical devices and is also claimed to be sturdier.

The apparatus is used successfully in drying tracing paper (and in improving its quality). In the case of a commercial test paper, which depends on the interaction of two reagents with the generation of oxygen, the propane combustion apparatus also functions more rapidly than does the electrical apparatus. Other papers are also dried very successfully with the propane-burning equipment. J. Lherault (Soc. Antagas, Paris, France). *Assoc. Tech. Ind. Papetière Bull.*, 1953, 69-73. (In French.)

Factors influencing the drying of insulating board

A study is made of the mechanism and the rate of drying boards (varying from 680 to 965 lb. per 1000 sq. ft.) under constant conditions. This indicates that drying from the press-moisture stage could be divided into three phases: (a) which is of limited duration, but in which the temperature, humidity and air-velocity *all* influence the drying; (b) the major phase, in sharp transition from the first—in which drying is affected largely by the temperature, and in which the drying time is proportional to the thickness of the board; and (c) that phase which effects the evaporation of the final 10-12 per cent of the moisture, and in which temperature is also the controlling factor. Twelve references are given. O. T. Dalley. *Australian Pulp and Paper Tech. Assoc. Proceedings*, 1952, 105-132; discussion, pp. 132-33.

Fire and explosion in a wallboard mill

Experts from three separate agencies investigated possible causes of an explosion and fire in a wallboard mill, at Ljusne in Sweden, hoping to prevent the recurrence of similar conditions.

The State Testing Station concluded that the heat generated by friction in one of the ventilating fans in a tunnel drier caused the disaster. The Swedish Steam Boiler Association found that the condition of the electrical equipment was unsatisfactory and that this might have been a possible cause. The Swedish Forest Products Research Laboratory and the Mechanical Testing Station (at Stockholm) studied the sprinkler system and the temperature conditions in the tunnel drier and concluded that a combination of local overheating and the accumulation of combustible gases may have been responsible for the original explosion, which was followed by fire.

Of these three explanations, the last one appeared most plausible to the Fire Insurance Commission, which also studied the damage and analyzed the various reports. Arne Hägglund. *Svensk Papperstidn.*, **56**, 378-83 (1953). (Original in Swedish), through *Bull. Inst. Paper Chemistry*, **23**, 804 (1953).

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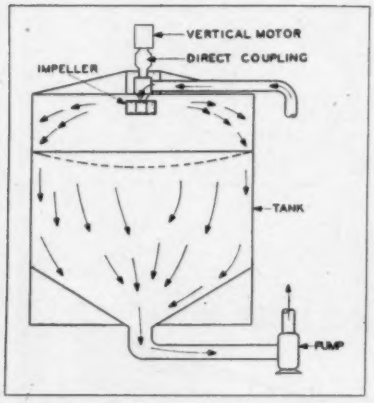
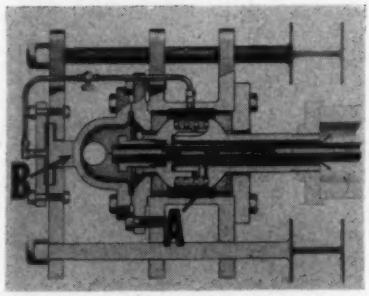


Stock chest agitator

The problem of how to keep stock from sticking or hanging to the sides of the stock chest has been reduced with a newly developed "Side-Flo" unit. This new unit requires no change in location of either charge or discharge piping. It is mounted in the entering suction and consists of a vertical motor direct coupled to an open impeller. The motor and coupling are mounted outside the chest and the impeller inside.

Stock enters the impeller in the center and is immediately thrown to the outer chest walls where it settles down to the stock level in the tank. This causes the slight build-up to take place around the outer circumference of the chest (see accompanying figure), giving a concave surface, the magnitude of which depends upon the stock consistency. The added weight around the edge causes flow to take place first along the outer tank circumference. At the same time, stock in the center of the chest is caused to flow due to the outer periphery flow, and the over-all effect is discharge from the entire chest cross-sectional area.

Also, the impact of the stock hitting the inside chest wall prevents any stock from sticking to the wall as the stock level rises and falls. Dead pockets, dried out and contaminated pulp is reduced to a minimum. *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*



Joint automatic load compensator

A new development which can considerably reduce the power requirements of rotary joints used on cylinder dryers is known as the joint automatic load compensator. This device offers a means of counteracting the pressure on the sealing member of the joint, thus reducing friction load and increasing service life.

This new compensator takes the form of an attachment, which is supported by the

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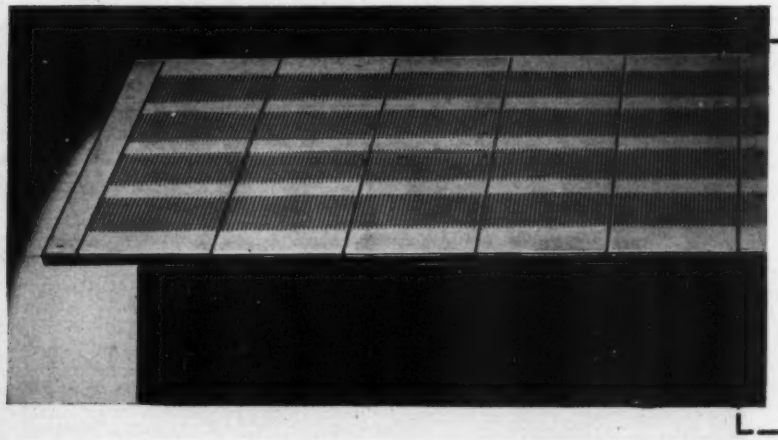

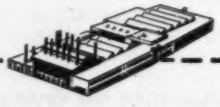

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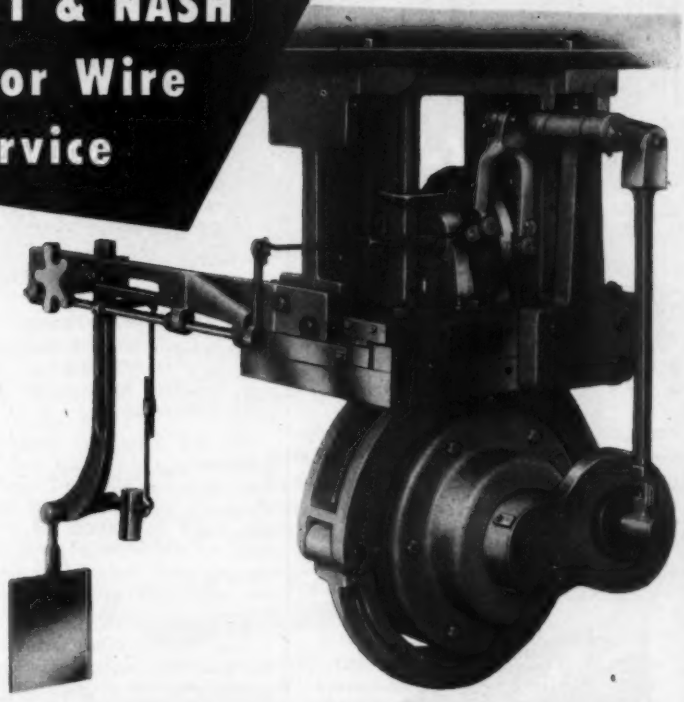

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same rods that support the Type L joint, and which is locked in position by adjusting nuts on these rods to exert a force against the joint body. It houses a flexible metal diaphragm and a heavy metal plunger. Pressure from the joint, admitted to one side of the diaphragm, is transmitted by the plunger to act upon the joint body.

The accompanying figure shows the basic principle of operation. Pressure within the joint exerts a sealing force, represented by "A." This same pressure is transmitted through connecting tubing to exert a force, represented by "B," against the joint body. The total pressure, or force, at "B" then offsets to a high percentage the total pressure, or force, at "A." Body steam inlet is located 90° from rod support lugs. Since both of these forces stem from the same operating pressure within the joint, the ratio between them remains a fixed constant.

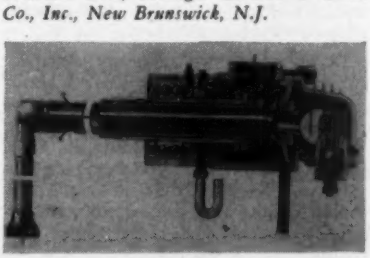
This compensator can be utilized with all Johnson joints having lug-type bodies, which require some suitable anchor for support rods. *Johnson Corp., Three Rivers, Mich.*

Plastic pipe

Flexible and semi-rigid plastic pipe has recently been developed.

The flexible plastic pipe is made of three types: non-toxic, industrial and suction. All three are made of Polyethylene. The non-toxic type is made in sizes ½ in. to 6 in. and all sizes up to 3 in. are available in coiled form. Among its advantages are its extreme light weight, its flexibility, its smooth interior which allows greater flow, and its resistance to rot, rust, and electrolytic action. It is used for the conveyance of liquids for human or animal consumption. The industrial type has the same characteristics as the non-toxic type except that it is used in various industries to convey corrosive liquids, natural or artificial gas, sewage, etc. The suction type, available in sizes 2 through 6 in., is designed for higher pressures in the larger sizes.

The semi-rigid plastic pipe is made of Butyrate and is available in ½ through 6 in. in 20 ft. lengths, with one coupling cemented. This type is flexible enough to follow ditching contours yet its impact strength eliminates special care in back filling. It is chemical resistant and resistant to rust, rot, and electrolytic action. *Plastic Products Div., Triangle Conduit & Cable Co., Inc., New Brunswick, N.J.*



Rotating steam joint

The "Rotodrain" is the most advanced and complete design of rotating steam joints and features for the first time an integral drainage control.

Additional features of the Rotodrain are as follows: the integral flow control is installed by a double window in the trap part of the Rotodrain; the syphon pipe arrangement can be taken out from the line without removing the joints from the cylinder; the syphon pipe itself can be adjusted radially from outside and the adjusting lever indicates at the same time the position of the syphon pipe in the cylinder; any leakage of the rotating seal is visible in the leakage control tube which connects the chamber between the seal and the bearing with the atmosphere; to avoid stoppage of cylinders due to leaky joints, an external adjustment is provided to increase the tension between the carbon ring and washer during the operation in order to stop leakage, and all parts of the Rotodrain can be taken apart in the line without removing the steam joint from the cylinder. *Velan Engineering Co., 1 Exchange Place, Jersey City, N.J.*

Hook-on voltammeter

A redesigned hook-on voltammeter with higher voltage and current ranges and a new pointer-stop mechanism is designated as Type AK-1A.

The new instrument will measure alternating current instantaneously on five scale ranges up to 750 amps. It can be used on both insulated and non-insulated conductors by simply hooking it around the power

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line. No separate transformers or additional equipment are required. The voltammeter will also measure ac voltage on three ranges up to 750 v. To use these ranges, the terminals are connected to the line, and a positive-action selector switch is turned to the desired scale.

The pointer-stop mechanism permits the user to quickly determine peaks in motor starting currents. The instrument is shielded magnetically. *General Electric Co., Schenectady 5, N.Y.*

Hydraulic-powered load stabilizer

An hydraulic-powered load stabilizer, an attachment for Elwell-Parker fork trucks with capacities up to 6,000 lb., has recently been introduced.

The unit is specially designed for safe transportation of unstable and semi-stable loads; it is also designated for stable loads which are subject to rough travel where they might be bounced off the skid or pallet on which they ride. In addition to carrying loads more safely, the stabilizer will allow fork truck operators to stack at great heights more safely.

Fork trucks, which accommodate the stabilizer, are standard vehicles; the only alteration is to the hydraulic system to regulate the operation of the attachment. The shape or size of the stabilizer plate may be altered to meet specific loads. Usually, the plate is faced with steel, although it may be faced with rubber or wire mesh if desired.

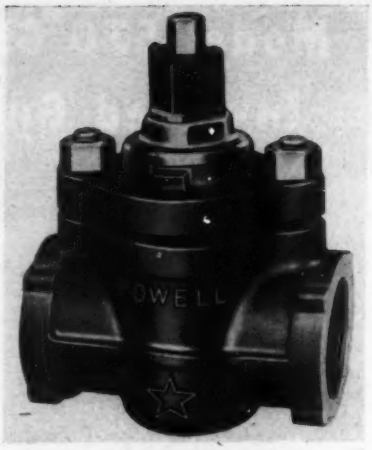
The stabilizer is powered by an hydraulic cylinder with a pair of telescoping guides. The control handle of the unit is located adjacent to the operator's right hand. Clamping pressure can be varied to suit the product being handled within limits of 150 to 1,350 psi. An hydraulic pressure blow-off valve is part of the system to prevent crushing the load due to excessive clamping after the pressure has been set. *Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio.*

Liquid level control

A new attempt to simplify the problem of liquid level control has recently been announced. Introduced as Johnson tank controls, the new approach is said to reduce the task of controlling levels in tanks, vats or other vessels to a matter of three time-tested, standardized components: an electrode holder, a relay, and a direct-operated solenoid valve.

In operation, two stationary electrodes are suspended in the tank where a circuit between them is established or broken by the rising or falling of the liquid level. This circuit actuates the relay which, in turn, operates the solenoid valve. This valve may be installed in either the tank supply or discharge line, whichever operating conditions require for proper level control.

Components are available in several sizes and can be used with liquids of all types. *Johnson Corp., Three Rivers, Mich.*



Lubricated plug valves

A new line of semi-steel and steel lubricated plug valves is now offered to industry. Features of the new lubricated plug valves are said to include quick and positive shut-off. All are wrench-operated and require only a quarter turn to open or close the valve. Lubricant grooves surrounding each port provide a positive seal when these valves are closed. In an open position, seating surfaces are not exposed.

These lubricated plug valves come with screwed or bolted glands. The semi-steel valves are available for 175 and 200 lb. W.O.G. Carbon steel valves are available for 150 and 300 lb. W.P. *William Powell Co., 2525 Spring Grove Ave., Cincinnati 22, Ohio.*

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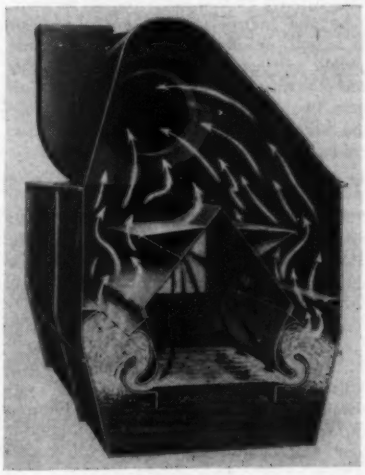
Loader

A line of versatile loaders, adaptable for use on any truck, has recently been announced. Available in a wide range of capacities, from ½ to 2-ton lifts, the unit converts a truck into a self-loading crane.

The crane unit mounts directly behind the cab and occupies from 16 to 18 in. of space. There is no reduction in truck body or platform capacity, and the entire load-carrying capacity of the bed is retained. Installation is simple as there is no need to cut or alter the truck body—it is simply moved back on the frame.

The loader is made in two models: one with an elevating mast, and one with a "fold-over" superstructure. In the latter model, the top portion of the structure can be folded down for traveling, and for bridge and door clearance. On the "fold-over" models the boom swings 170°; on the elevating mast models the swing is a full 360°.

Power for hoisting is supplied by the truck engine through a power take-off. The unique type of winch used employs standard automotive parts for simplicity of operation and service. *Ray-Lind Mfg. Co., Iron River, Mich.*



Dust collector

The new Design 4, Type N Roto-Clone dust collector is an improved hydrostatic precipitator that separates the dust from the air by means of an S-shaped water curtain. This water curtain has proved highly effective in collecting most types of process dust, according to the manufacturer.

Among the improved features are: non-plugging water entrainment separators; heavier sludge ejector mechanism; wider range of sizes and capacities, and sectional construction to permit field conversion from one arrangement to another.

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The Type N Roto-Clone is now made in sizes for capacities from 1,000 cfm to 48,000 cfm. It is available in three basic arrangements, which are identical in operating principle but differ in hopper design and means of sludge removal. The three arrangements provide manual cleanout, continuous drain and sludge ejection by flight conveyors. *American Air Filter Co., Inc., Louisville 8, Ky.*

Carbon steel for sulfate digesters

A special steel for sulfate digesters is now being made. This steel is of the rimming type, similar to the rimming steels used in digester service some years ago. It combines the desirable qualities of old-type rimming steels with the characteristics necessary for easy fabrication of heavy gauge metals.

This special material can be supplied in the widest range of plate widths, thicknesses and lengths available from any industrial source, as well as in a broad range of spun and pressed head sizes and shapes, according to the manufacturer. *Lukens Steel Co., Coatesville, Pa.*

Industrial x-ray radiography equipment

A completely new Norelco line of industrial X-ray radiography equipment for 150 KvP and 300 KvP applications is now available. Vastly different than medical units which are usually re-adapted for industrial use, the new equipment has been specifically designed for industry to meet all requirements of radiographic and fluoroscopic industrial examinations.

The complete 150 KvP X-ray radiography assembly consists of four units: the generator, the control cabinet, the tube and the handling device. The 300 KvP assembly consists of six units: two generators, the control cabinet, the tube, the tubestand, and the oil pump.

The 150 KvP unit will penetrate more than two inches of steel with suitable intensifying screens. The 300 KvP will penetrate more than twice that thickness. X-ray tubes for the units have been designed in various types to suit specific inspection and testing procedures. *North American Philips Co., Inc., 750 S. Fulton Ave., Mount Vernon, N.Y.*

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Books

CHEMICAL PROCESSING OF WOOD. By Dr. Alfred J. Stamm and Dr. Elwin E. Harris. Published by Chemical Publishing Co., Inc., 212 Fifth Ave., New York, N.Y. 5¾ x 8¾. 600 pages. $12.00.

All available information on the chemical utilization of woods, especially of wood residues and inferior species of wood, by both conventional and new methods, to produce modified wood products, pulp products and various derived chemicals is included in this book.

Chief emphasis is placed on the newer processing methods that have not previously been assembled in book form. To make this material more understandable and usable by those interested in details, chapters covering the fundamental chemical and physical properties of wood have been included.

The manufacture of impreg and compreg, the preparation of staypak and acetylated wood, new techniques for molding these and other products, wood-base plastics, high-strength paper laminates, lignin-filled laminates, pulp preforms, low-density core materials, chemical seasoning and solvent seasoning methods, hydrogenation of lignin and wood, wood-sugar molasses, fermentation products other than grain alcohol, growing yeast and wood sugars, and vanillin production from wood are among the many interesting topics covered in this comprehensive volume.

The subject is presented in a simple and straightforward style, avoiding, when possible, complicated chemical terminology. For the chemist and engineer who are interested in more detail, a rather extensive bibliography has been included with each chapter. The book is not a mere compilation of literature data, but a critical survey which presents both the favorable and unfavorable features of each process, together with the economic limitations.

EUROPEAN TIMBER STATISTICS, 1913-1950. Published by Food & Agriculture Organization of the United Nations. Distributed by International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N.Y. 8½ x 11. 198 pages. Paperbound. $1.75.

Written in both English and French, this volume is divided into three sets of tables, 21 dealing with production, 44 with trade, and 4 with consumption. Within each section a distinction has been made between the various wood products according to the degree of processing to which they have been subjected.

The figures shown in the tables have been mainly drawn from the official publications of governments or from the "Country Studies" written by experts in connection with the preparation by the Secretariats of FAO and ECE of the Study "European Timber Trends and Prospects." This information has been supplemented by figures taken from the publications of international organizations and publications of a wide variety of professional, technical and trade associations. Use has also been made of unpublished information made available to the FAO and ECE Secretariats from both official and private sources.

The first 30 pages of the book contain explanatory notes presenting: the methods of compilation; notes on the country statistics; notes on the definitions; conversion factors; a list of all the published and many of the unpublished sources from which the data in the statistical tables have been drawn, and a list of symbols and abbreviations used in the tables.

AUSTRALIAN PULP AND PAPER INDUSTRY TECHNICAL ASSOCIATION PROCEEDINGS, 1952. Vol. 6. Published by Australian Pulp and Paper Industry Technical Association, P.O. Box 18, South Melbourne, Victoria, Australia. 5¾ x 8¾. 282 pages.

This volume comprises the proceedings of the General Conference of APPITA, held March 3 to 7, 1952 in Melbourne, Australia.

Beginning with W. E. Cohen's presidential address, the book goes on to present the 16 papers given at this conference, together with tables, diagrams, graphs, photographs, bibliographies, a summary, and discussion. A list of officers and commitees for 1952-53, a register of new members from October, 1951 to October, 1952 and a register and directory of company and sustaining members is included.

Typical of the papers presented are: "The Pneumatic Handling of Groundwood Pulp," "Stock Cleaning for Board Mills," "Factors Influencing the Drying of Insulating Board," "Corrosion of Sulfate Mill Digesters," "Titanium Dioxide and Its Application to the Paper Industry," and "Yacca Resin—Its Use as a Paper Sizing Agent."

Booklets and Pamphlets

ADDITIVES. Published by Petroleum Educational Institute, 9020 Melrose Ave., Los Angeles 46, Calif. 80 pages. $1.50. New developments in the field of additives used in industrial and automotive oils and greases are described in this booklet. Included are 110 illustrations.

THE ELECTRICAL PROPERTIES OF PENTACHLORDIPHENYL-IMPREGNATED GLASS FIBER PAPER (PB 111030). Published by U. S. Department of Commerce, Office of Technical Services, Washington 25, D. C. 50 cents. This report of scientists at the Naval Research Laboratory brings out that, to a certain extent, the temperature stability of a new dielectric material, impregnated glass fiber paper, can be determined by studying the way each of its component materials (glass, glass fiber, impregnant) changes electrical characteristics with change of temperature. Accurate data on the electrical characteristics (loss factor, dielectric constant, etc.) for each of the component materials and for the impregnated glass fiber paper are included.

HUMIDITY CONTROL (PB 106382). Published by U. S. Department of Commerce, Office of Technical Services, Washington 25, D. C. $1.00. This bibliography on humidity, prepared for the Quartermaster Corps, has a section on humidity measurement and control in industry, in addition to sections on effects of humidity on foods, metals, textiles, plastics, paper and leather and a section on physiological effects of humidity. This bibliography, which covers the years 1945-1951, includes 120 references, with abstracts.

TECHNICAL NOTES, NOS. 386 TO 390. Published by Lake States Forest Experiment Station, University Farm, St. Paul 1, Minn. 8 x 10½. Topics covered in these one and two-page papers are as follows: Results of Improvement Cutting in Second-Growth Northern Hardwoods in Upper Michigan; Deer Damage to a Jack Pine Plantation in Michigan; Some Effects of Spacing on Jack Pine Development after 25 Years; Comparative Height Growth of Native Conifers in Northeastern Minnesota, and Volume in Tops and Limbs of Sawlog Trees.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.

Lubricated Plug Valves. William Powell Co., 2525 Spring Grove Ave., Cincinnati 22, Ohio—This 12-page revised catalogue (PV-2) describes the three types of lubricated plug valves: single gland, screwed gland, and bolted gland. Cutaway views of each type are shown. Tables giving list prices and dimensions of the various sizes are included. Valve accessories and component parts are pictured and their specifications listed. Other types of valves in the Powell line are also shown.

Temperature Recorders. Foxboro Co., Foxboro, Mass.—Bulletin 447 contains complete details of temperature recorder construction in its 20 pages. One section is devoted to selecting the correct thermal systems for temperature measurement applications. Characteristics of vapor pressure, gas pressure and liquid expansion systems are explained in the text and reference charts. Actual installations are pictured, design features checked, thermal systems charted, and complete descriptions provided for rectangular and circular case instruments, temperature bulbs, charts and accessories. A brief description of indicating and

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controlling temperature instruments is given. More than 50 photographs, charts, and diagrams are included.

Diaphragm Motor Valves. Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa. —Specification Sheet 408-3 covers Honeywell Series 700 low flow diaphragm motor valves specifically designed for use in pilot plants and other low flow applications and where wide proportional band control systems are needed. The sheet gives pertinent specification data, such as sizes, inner valve types, construction, materials, body ratings and over-all dimensions. Also covered are some of the major design advantages of this valve.

Phenolic Resin Coating. Ric-wiL Plastic Coating & Mfg. Corp., 1290 Euclid Ave., Cleveland 15, Ohio—This 4-page bulletin (Form S-5251) describes Ricwilite 7100, a corrosion-resistant cold-set phenolic resin coating. Its physical properties are listed and various tests showing the chemical resistance of this coating are described. Application procedure is given. Photographs show various applications of the coating.

Chemical Processing Industry Products. United States Rubber Co., Mechanical Goods Div., Rockefeller Center, New York 20, N. Y. —A new catalogue of products for use in the chemical processing industries lists protective coatings, tank and pipe linings, plastic fittings, hose, pinch valves, packings, conveyor belts and expansion joints. Chemical properties, temperature limitations, sizes and recommended working pressures are covered in the new catalogue.

Selenium Rectifiers. American Rectifier Corp., 103 Walker St., New York 13, N. Y.—4-page Bulletin No. 271 lists 11 questions and answers in regard to American rectifiers. A partial list of industries using rectifiers is included.

Turbine-Generators. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.—This 20-page booklet, B-5418, illustrating some 30 applications of industrial turbine-generators, describes the six principal types of industrial turbines: non-condensing, non-condensing single-extraction, non-condensing double-extraction, condensing single-extraction, condensing double-extraction, and condensing. The characteristics of each are described in terms of the electrical power and process steam each is capable of delivering. The remainder of the booklet presents photographs and installation data on representative turbine applications in textile, manufacturing, metals, paper, petroleum, lumber, chemical and process, and food industries.

Process Equipment. Patterson-Kelley Co., Inc., 537 Warren St., East Stroudsburg, Pa.—Catalogue No. 12, containing 12 pages, covers dry blending, process and heat exchange equipment. Special emphasis is on the twin-shell dry blender. The bulletin covers characteristics, applications, capacities, power requirements and other specification data for twin-shell, double-cone and ribbon blenders; kettles, evaporators, stills, agitators, autoclaves, pilot-plant units; and heat exchangers.

Precipitators. Research Corp., Bound Brook, N. J.—"The Inside Story" is a new 4-page bulletin with conveniently arranged information for a quick understanding of the special design features of the Cottrell electrostatic precipitator for the paper industry. A diagram and complete cutaway view of the equipment shows operating and construction details of the Cottrell precipitator.

Sprocket Wheels. Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.—Book No. 2467, a catalogue containing 8 pages, lists over 200 sizes of cast tooth sprocket wheels available from stock for 78 popular types and sizes of chains and tells how to select stock sprocket wheels for prompt delivery, accurately fitted to the chain.

Corrugated Expansion Joints. Flexonics Corp., 1315 S. Third Ave., Maywood, Ill.—A new 16-page illustrated catalogue, describing all types of Flexon corrugated expansion joints and the basic theory behind expansion joint design, gives complete specification and installation information for the recently redesigned Flexon line. Presented in the catalogue, designated as CMH-127R, are free-flexing expansion joints, controlled-flexing joints, and Flexoniflex integral-ring expansion joints. Also covered are dual, hinged, balanced, and bulkhead units.

Dehumidifiers. Westinghouse Electric Corp., Sturtevant Div., Dept. T-433, 200 Readville St., Hyde Park, Boston 36, Mass.—32-page Catalogue 1660 gives the complete story on surface dehumidifier units used to control humidity in large commercial and industrial buildings. Details of construction are presented, along with discussions on how surface cooling and evaporative cooling are put to work in the units. As an introduction to the instructions on how to select the correct unit, a set of typical specifications is presented. The booklet then presents a tested procedure for determining the size. Three sample problems are worked out. The latter part of the catalogue gives all the information necessary for installation and erection of the dehumidifiers.

Submerged Combustion. Submerged Combustion Co. of America, Inc., Hammond, Ind. —Why submerged combustion saves fuel and corrosion losses; what you get in an installation of submerged combustion; how submerged combustion operates, and where submerged combustion can be profitably applied are topics which are covered in a new 6-page booklet.

Speed Reducers. Dodge Mfg. Corp., Mishawaka, Ind.—Bulletin A-614-A, which contains 20 pages, offers full engineering information and selection data on the complete line of Dodge torque-arm speed reducers and the new Dodge overload release, designed for use with the reducer. All data and tables have been revised to cover the new Size No. 7 torque-arm speed reducer. A new and quicker method of selection is included. In addition to perspective illustrations of the reducer and overload release, the new bulletin includes cross section views and engineering diagrams showing proper positioning for installation.

Wet End Instrumentation. Minneapolis-Honeywell Regulator Co., Station 213, Industrial Div., Wayne & Windrim Ave., Philadelphia 44, Pa.—Instrumentation Data Sheet 29.7-1, containing 2 pages, describes methods of measuring and controlling critical wet end variables. Included in the sheet are the benefits derived from the proper application of instruments, a typical application drawing, and an installation photograph of a custom-engineered wet end control cubicle.

Vertical Pumps. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—Construction features of small vertical pumps for sidewall or submerged mounting are described in a new 8-page bulletin, 52B6975A. Helpful curves and tables to determine motor frame, horsepower, speed and current characteristics for the various units are included. Also given are construction details of shaft seals and motors.

Automatic Voltage Stabilizers. General Electric Co. Schenectady 5, N. Y.—A new 12-page bulletin (GEA-5754) on automatic voltage stabilizers ranging from 15 to 5,000 v amps. contains photographs and diagrams of the equipment, explains operation principles and construction, and gives complete specifications. It also describes the causes and effects of voltage variations and lists typical applications for stabilizers.

Relays. Automatic Electric Co., 1033 W. Van Buren St., Chicago 7, Ill.—A complete line of telephone-type relays, including hermetically sealed (in metal and glass containers) sub-miniature, plug-in types, etc., is described in this 12-page circular, No. 1702-A. A section on how to order automatic electrical relays, including numerous tables, is given.

Surface-Active Agents. Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y.—"Surface-Active Agents Find Widening Uses" is the title of an article reprint that describes the large number of non-ionic surface-active agents made possible by varying the polyhydric alcohols and fatty acids. The chemical structure and physical properties of these agents are discussed. The applications of polyhydric alcohol fatty acid esters in the paper, plastic, resin, adhesive, emulsion, textile, food and other industries are noted. Specific uses in these industries are given.

Industrial Fans. Westinghouse Electric Corp., Sturtevant Div., Dept. T-415, 200 Readville St., Hyde Park, Boston 36, Mass.—Eleven sizes of new industrial fans and their standard wheels are fully described in a new 12-page booklet, SA-6873. In addition to presenting a table of condensed specifications on performance and dimensions, the booklet discusses each of the three available wheel types —air handling, material handling, and long shavings—and gives typical applications for each. Also, arrangements in which the fans may be obtained are shown and described. Accessories available and special features are pointed out and fully discussed. To aid in the selection of a fan for high temperature applications, a table of maximum operating rpm's for various fan sizes and operating temperatures is presented.

Valves. Ohio Injector Co., Wadsworth, Ohio —A new catalogue digest, containing 20 pages, is a handily-indexed valve selection booklet. This catalogue digest also contains useful pressure-temperature rating charts and trim charts for both forged and cast steel valves, in addition to a pressure-temperature chart for composition disc application in bronze and iron valves.

Hook-On Instruments. General Electric Co., Schenectady 5, N. Y.—A new 8-page booklet describing G-E's complete line of hook-on instruments for general testing and maintenance is now available. Designated GEC-901, the booklet contains applications, operation, and basic features of the hook-on type AK-1A voltammeter, AK-2 wattmeter and AK-3 power factor meter.

Corrosion-Resistant Linings. U. S. Stoneware Co., 60 East 42nd St., New York, N. Y.—Bulletin TL-526, containing 12 pages, presents the complete history of "Tygon" as a lining and covering material. It discusses Tygon's composition, physical forms, physical properties, and where and how to apply it. Extensive tables give a thorough picture of Tygon's chemical resistance. Comparisons with various types of lining materials are made. Methods of preparation, application, maintenance and repair of mechanical damages are also presented.

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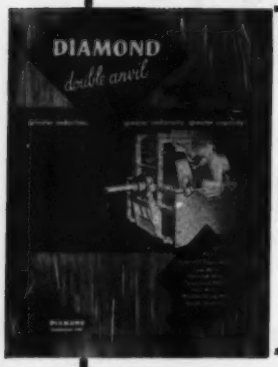

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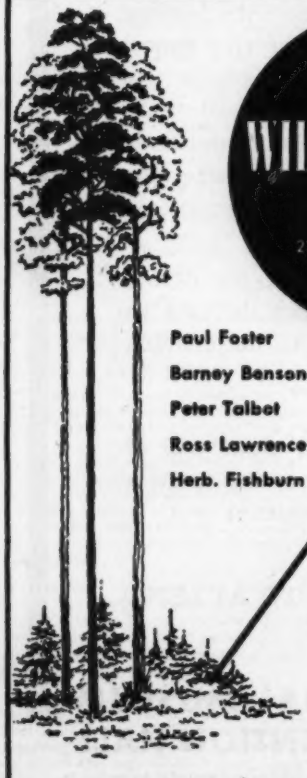

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MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are quotations to mills, f.o.b. New York:

No. 1 White Shirt Cuttings	11.50 to 12.50
New Unbleached Muslins	13.50 to 14.50
Fancy Shirt Cuttings	6.75 to 7.00
No. 1 Percales	6.75 to 7.00
No. 1 Washables	3.50 to 3.75
No. 1 Light Silesias	8.00 to 8.50
No. 1 Light Prints	6.50 to 6.75
Light Flannelettes	8.00 to 8.50
Cottonades	4.00 to 4.25
Blue Overalls	7.00 to 7.50
Blue Cheviots	7.00 to 7.50
Canton Flannels, Bleached	11.00 to 11.50
Canton Flannels, Unbleached	11.00 to 11.50
Osnaburg Cuttings	8.00 to 8.50
Underwear Cuttings, Bleached	14.50 to 15.50
Underwear Cuttings, Unbleached	14.50 to 15.50
Khaki Cuttings—	
Sun Tan	8.50 to 9.00
Mixed	4.00 to 4.25
Linen Cuttings—	
American	8.00 to 8.50
White	13.00 to 14.00
Grey	13.00 to 14.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.25 to 1.35
No. 2	.95 to 1.05
No. 3 and 4	.80 to .90
Twos and Blues—	
Repacked	2.25 to 2.50
Thirds and Blues—	
Repacked	2.00 to 2.25
Miscellaneous	1.75 to 2.00
Whites, No. 1—	
Repacked	5.50 to 5.75
Miscellaneous	4.75 to 5.00
White, No. 2—	
Repacked	4.50 to 4.75
Miscellaneous	3.75 to 4.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	4.50 to 4.75
Domestic	4.75 to 5.00
Wool Tares—	
Light	5.50 to 5.75
Heavy	5.75 to 6.00
No. 1 Scrap Bagging	3.75 to 4.00
Manila Rope—	
No. 1 large	7.00 to 7.50
No. 1 small	6.00 to 6.50
Sisal Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.50 to 5.75
New Burlap Cuttings	6.50 to 7.00
Jute Threads—	
Foreign (Nom.)	6.75 to 7.25
Domestic	6.75 to 7.25
Strings—	
No. 1 sisal	5.25 to 5.50
No. 2 sisal	4.75 to 5.00
Soft jute	5.25 to 5.50
Mixed	3.00 to 3.25

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

Shavings—	per ton
Hard White Env. Cuts	115.00 to 125.00
Hard White No. 1	85.00 to 90.00
Soft White, one-cut	70.00 to 75.00
Soft White, No. 1	55.00 to 60.00
Coated Soft	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	22.00 to 24.00
Mixed Books	16.00 to 17.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 40.00
Manilas—	
New Env. Cuttings	65.00 to 70.00
New Env. Cuts, One-Cut	
Extra Manilas	22.50 to 25.00
Manila Tab Cards, Free of Ground Wood	65.00 to 70.00
Colored Tab Cards	45.00 to 50.00
Kraft—	
New Envelope Cuttings	65.00 to 70.00
Tripled Sorted No. 1 100%	37.50 to 42.50
No. 1 Old Assorted	27.50 to 32.50
News—	
White Blank	55.00 to 60.00
Overissue	25.00—
No. 1 Folded	18.00—
Old Corrugated Containers	20.00—
New Jute Corrugated Cuts	28.00—
Mill Wrappers	19.00—
New Board Chips	16.00—
No. 1 Mixed Paper	15.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.55—
Ground, cwt.	3.85—
Powdered, cwt.	4.70—
Blanc Fixe—	
Pulp, bulk, ton	100.00—
Dry, barrels	105.00—
Bleaching Powder—	
Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard)	
30-80 mesh (bags), lb.	
80-100 mesh (bags), lb.	28.00—
Argentine, lb.	25.00—
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	17.00 to 25.00
Imported (ship side) Bulk (lump) ton	20.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.93—
Gelatine (silicon), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	41.00—
Litharge, powd. bbl. lb.	.15½ to .16

MARKET QUOTATIONS

Rosin (Gum)—	New York, per 100 lbs.
E	8.50—
F	8.50—
G	8.50—
WW	8.75—
Rosin (Wood), carlots,	
F.O.B. South	6.50—
Salt Cake—	
Dom. bulk (wks) ton	19.00 to 23.00
Imp. bulks on dock—	
(Atl. ports) ton (Nom.)	22.00—
Soda Ash—	
Bulk (works) cwt.	1.45—
Paper bags, cwt.	1.75—
Soda (Caustic)—	
Solid drums, cwt.	3.70 to 4.45
Ground and flake, drums, cwt.	4.10 to 4.85
Sodium Silicate—	
60 deg. 55 gal. drums, (works) cwt.	1.60 to 1.70
40 deg. 35 gal. drums, (works), cwt.	1.35 to 1.40
Starch—	
Pearl, 140 lb. bags, cwt.	6.30—
Pearl, barrels, cwt.	6.30—
Paper (Sp.) bags, cwt.	6.30—
Powdered, barrels, cwt.	6.60—
Sulphur (Crude)	
(Mine) bulk, long ton	25.50 to 27.50
Talc—	
Dom. 100 lb. bags (mine) ton	25.00 to 28.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig, bbls., lb.	.22½ to .23
Calcium Pig, bbls., lb.	.22½ to .23
Zinc Sulphide, bbls., lb.	11.50 to 11.75

WOOD PULP

Quotations on domestic and Canadian wood pulp, dollars per short air dry ton, delivered consuming mills including basic freight allowances, follow:

Bleached Sulphite	140.00—
Bleached Sulphite, Canadian	140.00—
Unbleached Sulphite	130.00—
Unbleached Sulphite, Canadian	120.00—
Bleached Soda	140.00—
Bleached Soda, Canadian	140.00—
Kraft, Bleached	145.00—
Kraft, Bleach., Southern	142.50 to 150.00
Kraft, Bleach., Canadian	145.00 to 150.00
Kraft, Unbleached, Northern	132.50—
Kraft, Unbleached, Southern	100.00—
Kraft, Unbleached, Canadian	100.00 to 125.00
Kraft, Semi-Bleached, Southern	140.00—
Sulphite Screenings	72.50—
Sulphate Screenings	67.50—
Groundwood	82.50 to 87.50

Quotations on imported wood pulp, dollars per short ton, on dock American Atlantic ports with varying freight allowances, follow:

Bleached Sulphite, Swedish	130.00 to 140.00
Bleached Sulphite, Norwegian, freight allowed	140.00—
Bleached Sulphite, Finnish, freight allowed	140.00—
Unbleached Sulphite, Swedish	110.00 to 115.00
Unbleached Sulphite, Finnish, freight allowed	120.00 to 125.00
Kraft, Unbleached, Swedish	100.00 to 105.00
Kraft, Unbleached, Finnish, freight allowed	105.00 to 135.00
Kraft, Bleached, Swedish, on dock	137.50 to 142.50
Kraft, Bleached, Norwegian	

PAPER

Boards—

Prices per ton, delivered, 10 tons or more:

Plain Chip	85.00—
News vat lined chip	97.50—
Filled news	87.50—
Solid news	90.00—
White vat lined chip	135.00—
Chip tube and can stock	100.00—
Single manila lined chip	140.00—
Single jute lined chip	135.00—
Kraft liner	122.50—
White patent coated:	
.020	160.00—
.018	162.50—
.016	165.00—

Book Paper—

Coated two sides	
70 lb. No. 2 enamel, 25x38-500, trimmed 4 sides	4 cases $17.25 Carloads $16.30
45 lb. enamel, 25x38-500, trimmed 4 sides	4 cases $13.05 Carloads $12.10
Uncoated	
55 lb. No. 2 offset, 25x38-500, trimmed 4 sides	4 cases $14.80 Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases $14.05 Carloads $13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads $12.40
16 lb. tablet, 17x22-500	Carloads $11.35

Rag Content Bond—

Extra 100% rag	70.45—
100% rag	62.65—
75% rag	48.15—
50% rag	38.90—
25% rag	31.75—

Rag Content Ledger—

Extra 100% rag	72.65—
100% rag	63.90—
85% rag	52.50—
75% rag	49.40—
50% rag	40.20—
25% rag	33.00—

Sulphite Bond—

Air dry bond (Watermarked)	19.00—
No. 1 bond (M.F. watermarked)	15.00—
No. 2 bond (M.F. watermarked)	14.00—
Plain bond (M.F. unwatermarked)	14.00—

Sulphite Ledger—

No. 1, M.F. watermarked	20.50
No. 2, M.F. watermarked	19.50
Plain, M.F. unwatermarked	19.00

News—	per ton
Rolls, Standard (Contract)	125.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	138.00—

Tissues (Carlots)—	per ream
White No. 1	1.75—
White No. 2	1.35—
Bleached Anti-Tarnish	2.20—
Colored	2.00—
Anti-Tarnish Kraft	1.65—
Manila	2.00—
Napkins, semi-crepe (12¾ lb. to M shts.) per ca.	.90—
Napkins, full crepe and embossed (12¾ lb. to M shts.) per ca.	.90—
Toilet, Bleached (M shts.) per ca.	9.35—
Toilet, Unbleached (M shts.) per ca.	7.90—

Towels	per case
Bleached	6.80—
Unbleached	5.90—

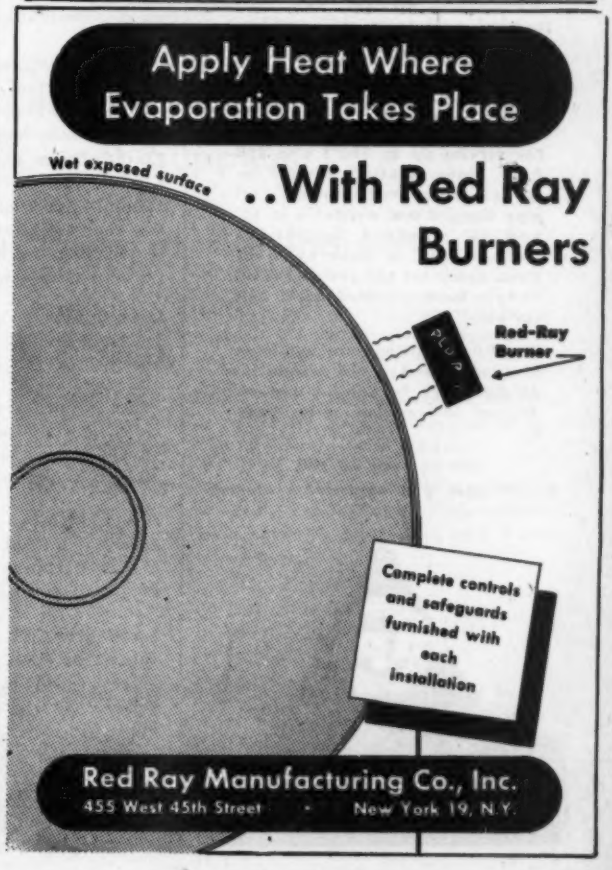
Wrappings (Kraft)—	per cwt.
Standard wrapping	8.00—
Butchers, counter rolls	8.50—
Standard bag, mill rolls	7.75—
Shipping sack, mill rolls	8.00—
Gumming, mill rolls	8.25—
Asphalting, mill rolls	8.00—
Envelope, mill rolls	9.50—

Kalamazoo GLAZED TILE TANKS AND CHESTS...

Engineered to your needs ... any size or shape ... impervious to corrosion ... keep contents clean ... reduce friction of flowing liquids ... easiest to clean ... last for years and years.
SEND FOR COMPLETE DETAILS

Kalamazoo TANK and SILO CO.
TILE TANK DIVISION
1027 HARRISON STREET ... KALAMAZOO, MICHIGAN

Apply Heat Where Evaporation Takes Place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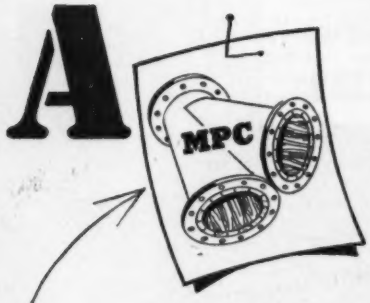
..With Red Ray Burners
Red-Ray Burner
PULP
Complete controls and safeguards furnished with each installation
Red Ray Manufacturing Co., Inc.
455 West 45th Street · New York 19, N.Y.

Q *what pipe is especially designed to lick the corrosion problem?*

A



WOOD-LINED STEEL PIPE

It's as simple as this:

. . . if your piping problem is corrosion, abrasion, frictional resistance or sliming

. . . if you're looking for a dependable, efficient and economical answer to this problem

then specify MPC WOOD-LINED STEEL PIPE, the pipe that combines the strength of steel with the durability of wood!

For service up to 180°F and 250 P.S.I. Higher pressure ratings for special service requirements. All pipe flanged and available in 10' and 20' standard lengths, or "tailor-made" to your specifications. Easily cut and reflanged; all flanges have standard ASME bolt circles.

Wood-lined fittings are available in standard and special designs for all diameters. For catalog and additional information, write Dept. P.I.

It's as easy as MPC
to lick your pipe corrosion problem!

mpc
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Bay City • Michigan
Manufacturers of Wood-Stave, Saran Rubber-Lined, Stainless Steel and Monel Piping. Represented nationally by Saran Lined Pipe Co. Detroit, (Ferndale) Michigan.

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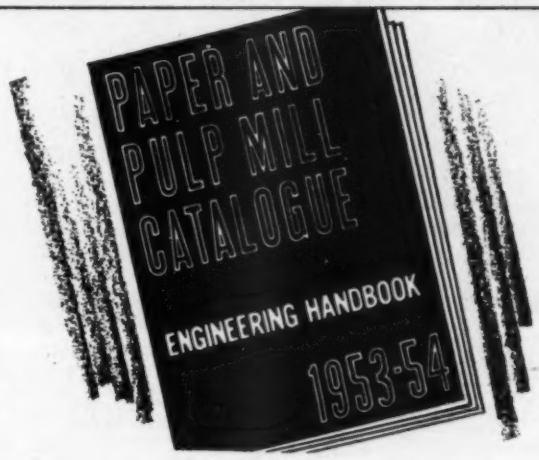

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Despite cleanliness and efficiency of a midwest firm's Plastic Division, shown above, there was "dirty work" afoot in the hydraulic systems of the injection molding machines. Division superintendent (left) and A. L. Seabaugh, of Standard Oil, came up with a solution.

Stops "dirty work" in hydraulic units

● A midwest company became increasingly aware that hydraulic oil performance in its fourteen injection molding machines was not all that it should be. Formation of oil deposits not only made frequent cleaning of filters necessary but posed a threat to efficient operation of the hydraulic units.

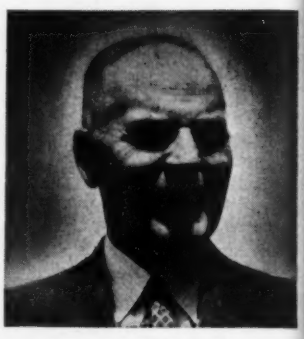
A Standard Oil lubrication specialist recommended STANOIL Industrial Oil, a top quality product of exceptionally high stability and containing necessary additives to prevent corrosion and oxidation troubles.

Throughout six years of continuous hard use, STANOIL has provided clean operation. It has not been necessary to replace any of the original fills of STANOIL, and only a small amount of make-up oil has been needed. Where filters previously had to be cleaned at least four times a year, they are now cleaned once each year. Hydraulic operation has been efficient and reliable.

STANOIL
TRADE MARK
Industrial Oil

You can rely on STANOIL to give you the same clean, dependable service not only in hydraulic units but in a wide variety of equipment. You can get the help of the Standard Oil lubrication specialist serving your section of the Midwest by phoning your local Standard Oil office. Or, write: Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Illinois.

What's YOUR problem?



A. L. Seabaugh, working out of Standard's Chicago office, is the lubrication specialist who helped this midwest firm gain both operating and maintenance benefits through use of STANOIL in hydraulic units.

Located throughout the Midwest is a corps of specially trained, experienced Standard Oil lubrication specialists, ready to give you prompt, on-the-spot help with lubrication in your plant. Their broad background of practical experience, plus their thorough training in Standard Oil Lubrication Engineering Schools, is yours for the asking. Simply phone your nearest Standard Oil Company office. The lubrication specialist will call without delay. He has a complete line of petroleum products to offer, including such outstanding lubricants as:

SUPERLA Greases — Available in a wide range of consistency grades and in both lime-soap and soda-soap types. SUPERLA Greases cover a wide range of operations. These efficient products are comparable in quality with the highest type of special greases.

STANOLITH Greases — Because these unique lithium soap products possess the heat resistant properties of soda-soap greases and the water resistant properties of lime-soap greases, they offer a solution to lubrication problems caused by the presence of both heat and water.

STANDARD OIL COMPANY

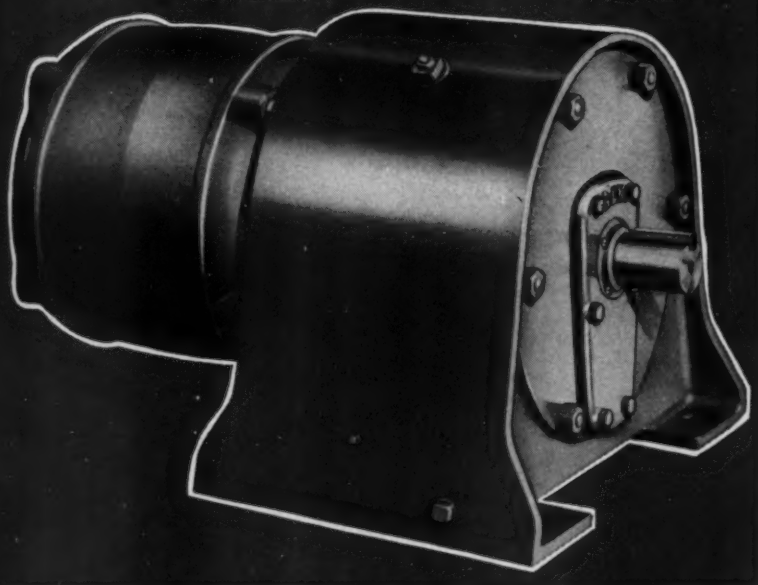
STANDARD (Indiana)

Announcing the *-Newly Designed-* **Integral**

ALL-STEEL **FALK Motoreducer**

(Gearmotor Type–Supplementing Falk All-Motor Line)

. . . with completely standard round-frame, D-flange motor



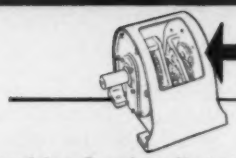
Check and Compare these features...

Meet a faithful old friend in a new, modern dress! The famous, time-proved Integral Type *all-steel* Falk Motoreducer (Supplementing Falk All-Motor Line) has been redesigned into a compact, streamlined unit providing the utmost in space economy—but retaining all the application versatility, long-life performance, easy-maintenance features and superior structural qualities that have made Falk Motoreducers the recognized standard throughout industry.

In this new Integral unit—rated in accordance with AGMA standards—a *completely standard* round-frame, D flange NEMA motor is mounted directly on the all-steel Motoreducer housing. The motor remains a separate piece of equipment, readily replaceable with any other type or make. Output speed (ratio) can be changed within unit's torque capacity without modifying motor. Size and arrangement of the standard housing permit wide ratio range—from 3.36:1 to 542:1.

In order to meet the greatest number of industrial application needs, the newly designed Integral Motoreducers are available in horizontal and vertical models, both in concentric and right-angle types; double, triple and quadruple reduction; horsepower range, 1 to 40 HP. Prompt stock shipment in standard ratios is offered.

Whatever your reduction requirements, you get greatest dollar-for-dollar value in the long run by standardizing on Falk products. Write for Bulletin 3104.



Every FALK Motoreducer has these "In-built" Factors—

Precision Gearing. Heat treated alloy steel, precision cut and shaved helical gearing throughout . . . quiet-operating crown shaved pinions . . . taper bored gears for easy ratio changes.

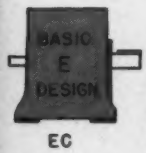
All-steel Housings. Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.

Streamlined inside and outside. Smooth, clean surfaces; machine welded construction conforms to NEMA motor frames.

Positive Lubrication. Large sump capacity . . . oil-tight construction assures clean lubricant . . . direct dip of revolving elements provides positive lubrication at all speeds.

Wide Speed Range. Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

Sealed Housings. Dual closures and one-way vents keep oil *in*, dust and moisture *out*. Units are splash-proof, leakproof, dustproof.



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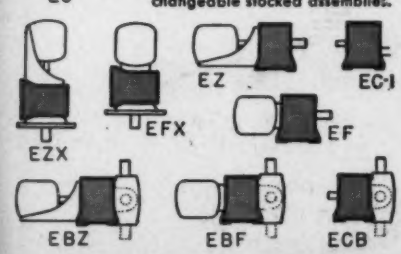

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This "Working Heart"

assures long life for your

LUNKENHEIMER VALVES

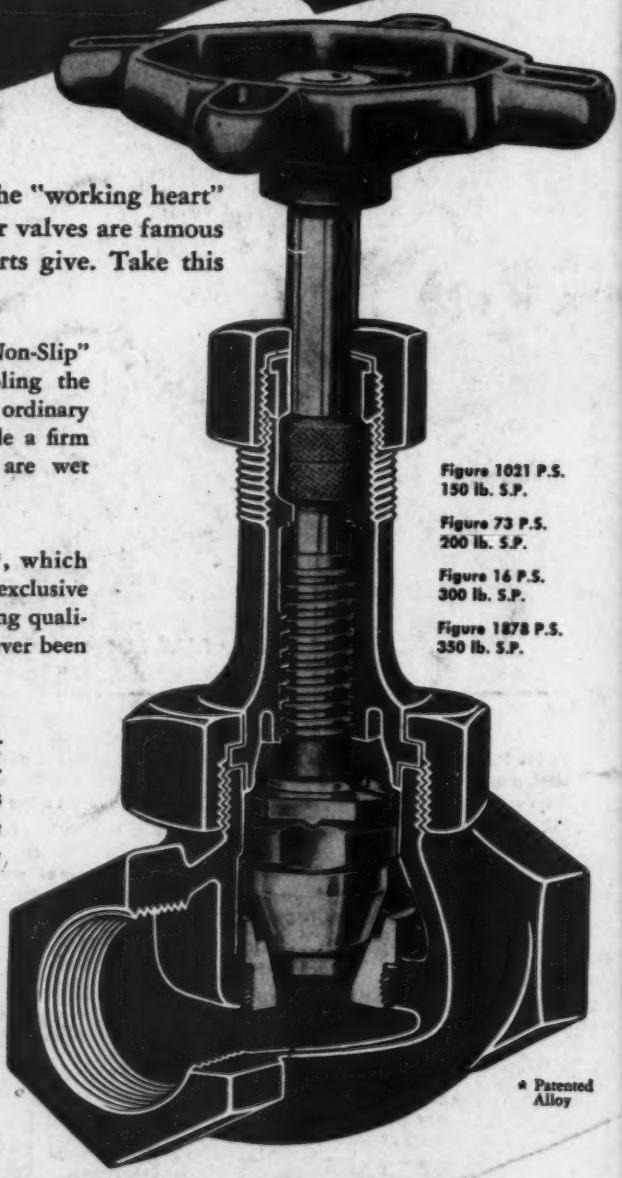

Figure 1021 P.S.
150 lb. S.P.

Figure 73 P.S.
200 lb. S.P.

Figure 16 P.S.
300 lb. S.P.

Figure 1878 P.S.
350 lb. S.P.

* Patented Alloy

Handwheel, stem, and disc . . . these parts are the "working heart" that affects the life of every valve. Lunkenheimer valves are famous for the long, economical service these vital parts give. Take this 200 lb. S.P. "Renewo" Valve, for example:

HANDWHEEL is the new cool-operating "Non-Slip" design that eliminates leakage by enabling the operator to close the valve *tight* with ordinary hand pressure. Four rounded lugs provide a firm grip even when the operator's hands are wet and greasy.

STEM is made of famous "Stemalloy"*, which eliminates stem-thread failure. Amazing exclusive silicon-bronze alloy has exceptional wearing qualities. Millions are in use, and not one has ever been returned due to wear failure.

DISC AND SEAT — 500 BRINELL STAINLESS STEEL — for long, trouble-free service where erosive and corrosive conditions are present. Disc and seat are renewable and can be easily replaced with fullway type seat and disc.

Write for Circular 577, a new bulletin which gives you complete information on the "Renewo" line. And for the finest service on valves, see your Lunkenheimer distributor. The Lunkenheimer Company, Box 360S, Cincinnati 14, Ohio.

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LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

L-483-53